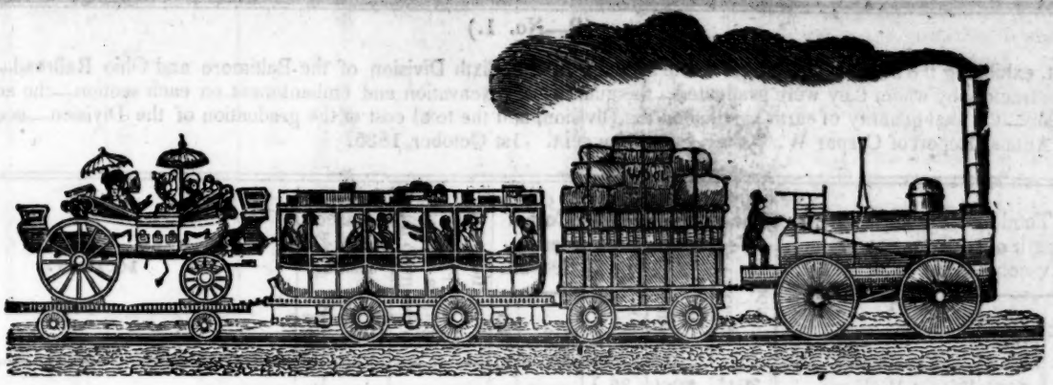

AMERICAN RAILROAD JOURNAL,
AND ADVOCATE OF INTERNAL IMPROVEMENTS.

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AMERICAN RAILROAD JOURNAL.

NEW-YORK, JANUARY 30, 1836.

In our last, we gave, from the Baltimore and Ohio Railroad Report, a document marked S, from the Report of C. W. Wever, Esq. to which we intended to have called attention. It relates to a subject in which Railroad Companies are deeply interested.

We have received from our friends at Albany, the various reports from the Commissioners in relation to that important work, from which we shall make such extracts as may be of interest to our readers.

In this number will be found tabular statements, showing the amount and cost of the graduation and masonry on the sixth division of the Baltimore and Ohio Railroad.

Extract of a letter from a gentleman proposing a new route for the termination of the Erie Canal, which we lay before those who are engaged upon the subject.

"I have seen something said of the Erie Canal, and its improvement between Schenectady and Albany, viz: to leave the Mohawk at the former place, and cut through the sand hills to Albany. Would it not be the interest of the State to keep the Canal on the north side of the Mohawk river, from the Lower Aqueduct—which is about three miles above Cohoes Falls—and drop from thence into the Champlain Canal near the city of Waterford? The Champlain Canal can easily be enlarged the "*spruyts*" of the Mohawk can be dammed, and a slack water navigation made to the city of Troy, for a moderate expenditure in comparison to that it would require to cross from Schenectady to Albany.

"Very respectfully, yours."

To CORRESPONDENTS.—In reply to our worthy correspondent E. W., we would say that it has been, and still is, our intention to adopt the course he suggests; to the correctness of which a few numbers of the Journal will bear witness—but *that*, with many other good intentions, were knocked so *far* into the month of February, by the late calamity, that we have not yet got a fair view of it. We hope, however, to give hereafter not only a column of CANAL, but of general RAILROAD intelligence also—and will commence with the next number.

From the Rochester Democrat.

RETRACTILE CANAL BRIDGE.—We were shown, this morning, at the office of J. Bassett, Architect, the model of a self-retracting bridge, invented by Mr. EDWIN AVERY, of this city It is an ingenious application of the principle of the inclined plane in throwing the bridge back to its place, instead of bringing it back by weights and pulleys, as was proposed in a recent invention noticed in this paper. Nothing can exceed this invention of Mr. Avery's in simplicity of construction, which is so necessary in every work of this kind. If such bridges can in any way be made available on our canals, we think this plan of construction the most feasible. To overcome the friction indispensable in working any such bridge, Mr. Avery has combined the mechanical powers of the *inclined plane* and the *wheel* and *axle*, and we have the opinion of scientific men that there are no difficulties in applying to practical uses this ingenious invention, which may not be easily obviated. We hope all mechanics, and those capable of judging wisely of such inventions, and all in the improvement and convenient use of our public Canals, will call and see the model in Child's buildings, opposite the Rochester House. M.

A VALUABLE INVENTION.—Dr. McWilliams, of this city, has taken out a patent for a stove for heating carriages of all kinds, which is one of the most valuable inventions which have ever been made. It is remarkable in its structure, and may be sold for six or eight dollars; and it consumes the most inconsiderable quantity of coal. The advantages of such a stove are almost too obvious to be mentioned. Taking up very little room, they may be fitted to the bottom of gigs or chaises, and of every variety of carriage, and are particularly well adapted to Railroad cars. The expense of fuel is about three cents for a hundred miles travelling, at an ordinary rate. It is only necessary to make this invention, knowing to secure its introduction very generally. For a trifling expense, a stage driver may now be as comfortably situated on his box, as by the by-room fire; and the pleasures of sleigh-riding may be enhanced a hundred fold. This stove is now used in the cars of the Baltimore and Washington Railroad, and gives entire satisfaction. The passengers are kept warm during the whole journey, and are never annoyed by smoke—the stove being air-tight. We intend, next week, to publish a drawing and specification of this stove, for the advantage of all who may be disposed to benefit by it.—[Washington Mirror.]

(B—No. 1.)

A Statement, exhibiting the number and length of the sections of the Sixth Division of the Baltimore and Ohio Railroad—the names of the Contracters by whom they were graduated—the quantity of excavation and embankment on each section—the actual cost of each section—the total quantity of earth handled on the Division, and the total cost of the graduation of the Division—accompanying the Sixth Annual Report of Caspar W. Wever, Superintendent. 1st October, 1835.

No. of Sections.	Length of Sections in poles.	Total length of Division. Ms.	Poles.	NAMES OF CONTRACTORS.	Solids in cubic yards. Excavation.	Embankment.	Price, in cents, of the greater solid.	Cost of each Section. Dolls.	Cts.	Total quantum of earth actually handled on the Division.	Total cost of the Division. Dolls.	Cts.	LOCALITY.
1	7878	.	7878	Robert Williams,	3945	3960	36	.	.	.	.	.	
.	.	.	.	Do.	2148	.	100	3573	60	6108	3573	60	This section begins at a point 2 miles and 10 poles above or west of the "Point of Rocks," to which point the graduation was done by the Chesapeake and Ohio Canal Company.
2	19393	.	27271	Johnson Garrett,	11485	11104	30	3445	50	17593	7019	10	This section crosses Poplar and Sugar Tree Branches.
3	18224	1	13495	John Littlejohn,	30829	9818	53½	16493	51	48422	20512	61	This crosses the greater Catoctin Creek.
4	30303	2	11798	P. Orville Littlejohn,	22740	22770	48½	11053	15	71192	34565	76	This crosses the Lesser Catoctin Creek.
5	31515	3	11313	Matthew Borland,	6613	10597	23	2437	31	81789	37003	07	
6	29700	4	9013	Alexander Stewart,	8854	8424	32	2833	28	90643	39836	35	
7	32715	5	9728	G. W. Higgins,	6548	15407	24	3697	68	106050	43534	03	This section runs through the town of Berlin.
8	30303	6	8031	Robert Kimble,	7598	6698	22	1671	56	113648	45205	59	
9	23030	7	31061	Thos. M. Macubbin,	12767	5680	29	3701	56	126415	48907	15	Passes Garrott's mill.
10	44921	8	11982	David Lemmon,	16893	20465	41	.	.	.	.	.	
.	.	.	.	Do.	.	2619	40	.	.	.	.	.	
.	.	.	.	Thos. M. Macubbin,	.	125	20	9463	25	149614	58370	40	This section crosses the divisional line between Frederick and Washington Counties, and also Israel's Creek, and terminates at a point 2 miles east or below the bridge at Harper's Ferry. From the end of this section to said bridge, the graduation was done by the Chesapeake and Ohio Canal Company.
.	.	.	.	*By sundry persons.	600	.	.	622	94	150224	58993	34	

*Several points of Rock were removed by Messrs. Littlejohn, Higgins and Macubbin; for which $622.94 were paid—the cubic yards in these points are estimated—all the other work was measured.

NOTE.—If the 2 miles and 10 poles next above the "Point of Rocks," and the two miles next below the Bridge at Harper's Ferry, both of which distances were graduated by the Chesapeake and Ohio Canal Company, be added, then the length of the Division will be 12 miles and 129.82 poles. The total distance from Pratt-street, Baltimore, was shown in a former report to be 67 miles, 199.16 poles. If to the length of this Division be added the total distance from Pratt-street, to the "Point of Rocks," then the whole distance from Pratt-street to the Bridge at Harper's Ferry, will be 80 miles, and 8.82 poles. The graduation between Baltimore and the "Point of Rocks," cost $804,147.40, which, added to the amount shown above, makes the gross sum of $863,140.74.

From the Journal of the Franklin Institute.

On the transport of Heavy Burthens upon Ice. By THOMAS JEFFERSON CRAM, Prin. Assist. Prof. of Nat. and Exp. Philos., U. S. Mil. Acad.

TO THE COMMITTEE ON PUBLICATIONS.

Gentlemen,—Having seen an account of the following experiments on the resistance of ice, by Assistant Professor Cram, I deemed it of sufficient interest to your readers to request from him permission to publish it. He has kindly furnished the following abstract, which is transmitted for publication.

Very respectfully yours,
A. D. BACHE.

West Point, Oct. 7th 1835.

Dear Sir,—For ordnance purposes, it became necessary, on the 13th of January, 1835, to transport a heavy piece of Artillery (an iron 24 pounder) across the Hudson, from West Point to Cold Spring Foundry. To insure safety, two ox sleds were connected, one after the other, and upon which two timbers were longitudinally placed and secured; between these timbers, the gun, previously dismounted from its carriage, was swung, by resting its trunnions upon them, at such points that the whole pressure was distributed, as uniformly as possible, upon the ice which sustained it. A pair of horses were attached to another sled, which was connected with the foremost of those above named, by a rope about thirty feet in length,

The ice over which the gun was taken had been chiefly formed during that intensely cold week (in January 1835,) when the mercury in Fahrenheit's thermometer ranged, here, between −2½ and −15. The effects of the pressure upon the ice were carefully observed, by myself, along the entire route, and were such as to induce the belief, that an idea of its strength could be formed with sufficient certainty to be of practical utility, in all cases where the safety of transporting any load upon ice might be jeoparded.

The ice was drilled through, and its thickness measured, to a tenth of an inch, at intervals of two hundred paces and less, along the whole extent of the track. From the place of departure, to the channel of the river, the thickness diminished from 16.5 in. down to 8 in, and no signs of cracking or bending were observed in the ice—the horses going at the rate of about four miles an hour. Across the channel, the thickness increased from eight inches to twelve inches, and no evidence of breaking or bending was exhibited,—the load moving with a speed of about eight miles an hour. From the west edge of Cold Spring flats, to the vicinity of the entrance of a creek, the thickness varied from 12 inches up to 15.5 inches, and no indications of yielding were perceived, the horses going at a gentle trot. Near the entrance of the creek, for an extent of fifty paces, the average thickness of the ice was only 5.56 in., and it was covered with a sheet of snow water, two inches in depth. This

(B—No. 2.)

An Exhibit of the Masonry on the Sixth Division of the Baltimore and Ohio Railroad, showing the names of the Contractors by whom it was constructed—its character—the quantum and cost on each section—and the total quantum and cost on the Division—accompanying the Sixth Annual Report of CASPER W. WEVER, Superintendent. 1st October, 1835.

No. of Section.	NAMES OF CONTRACTORS.	CULVERTS AND DETACHED WALLS.							ARCHED OR BRIDGE MASONRY.								Total quantum and cost of all kinds of masonry on the Division.			LOCALITY.
		No. of perches of 25 cub. feet.	Price per perch.	Cost on each Section.		Total No. of perches on Division.	Total cost on the Division.		No. of vents.	Size of each vent in feet.	No. of perches of 25 cubic ft.	Price per mile.	Cost on each Section.		Total No. of perches on the Division.	Total cost on the Division.	Quantum.	Cost.		Notes.
				Dolls.	Cts.		Dolls.	Cts.					Dolls.	Cts.		Dolls.		Dolls.	Cts.	
1	Robert Williams	3,128	1.50	4,692		3,128	4,692		.	.	.	.	.	.	.	.	3,128	4,692	00	
2	....Do.	371½	2.75	1,036	74	3,499½	5,728	74	1	12	495¼	3.19	1,579	85	495¼	1,579	3,994¼	7,307	59	1 × Sugar Tree Branch.
3	John Littlejohn	.	.	.	.	3,499½	5,728	74	2	50	3,651	7.75	28,295	25	4,146¼	29,875	7,645¾	35,603	84	2 × Claggett's Branch.
4	Charles Wilson	.	.	.	.	3,499½	5,728	74	1	15	525¼	4.00	.	.	.	.	.	.	.	2 × The Lesser Catoctin Creek.
.	....Do.	.	.	.	.	3,499½	5,728	74	1	20	1,431¼	4 00	,932	.	6,103	37,807	10	9,602¼	43,535	84
.	P. Orville Littlejohn	146¼	1.87½	289	69	3,646	6,118	43	.	.	.	.	.	.	6,103	37,807	10	9,749	43,825	53	3
5	....Do.	262	2.05	537	10	3,908	6,555	53	.	.	.	.	.	.	6,103	37,807	10	10,011	44,362	63	
6	Alexander Stewart	298½	3.00	865	50	4,196¼	7,421	03	.	.	.	.	.	.	6,103	37,807	10	10,299¼	45,228	13	
7	G. W. Higgins	401½	2.75	1,104	12	4,598	8,525	15	.	.	.	.	.	.	6,103	37,807	10	10,701	46,332	25	
8	W. B. Wheelock	212¾	2.45	521	24	4,810¾	9,046	39	.	.	.	.	.	.	6,103	37,807	10	10,913¾	46,853	49	
9	....Do.	326¼	1.85	603	56	5,137	9,649	95	.	.	.	.	.	.	6,103	37,807	10	11,240	47,457	05	
10	Charles Wilson	798½	1.87½	.	.	.	.	.	1	25	1,161¼	4.00	4,645	.	7,264¼	42,452	10	.	.	.	4 × Israel's Creek
.	Thomas M. Macubbin	324	1.50	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	
.	David Lemmon	13	1.87½	2,027	19	6,272½	11,677	14	.	.	.	.	.	.	7,264¼	42 452	10	35364	54,125	24	

NOTES—1. In the cost of the Culverts, the sum of $15.12 extra is included. 2. The Bridge of 15 feet span across Claggett's Branch, has a flat superstructure of wood, the cost of which viz. $75, and also the sum of $30 paid P. O. Littlejohn, for depositing stone around the abutments for the security of their foundations, are included in the sum of $7,932, stated as the aggregate cost of that Bridge, and of the one across the Lesser Catoctin Creek. 3. In the cost of the Culverts, $15 extra are included. 4. In the cost of the Culverts built by Chas. Wilson, the sum of $19.62 extra are included.

fifty paces of ice was observed to bend so much under the gun, that I was very apprehensive of its breaking; indeed, had the load been stopped for a few seconds only, it undoubtedly would have gone to the bottom. The depression along here was at least two inches, and the flexure of the ice under the foremost of the sleds, bearing the gun, was less than that under the hindmost, owing to its being weakened by the former, ere the latter came upon it. On crossing this weak spot, the horses had become so much fatigued, and the resistance increasing, by being drawn up the inclined surface of the bending ice, that, with much whipping and shouting, they were bearly urged to drag the gun safely over, at a velocity of about four miles an hour.

To determine the pressure sustained by a given superfices of the ice under consideration, it is to be remarked, first that, from the dimensions of the bottom surfaces of the four sled runners under the gun, the whole surface of ice in contact with these bottom surfaces, at the same time, was 6.458 square feet. 2. That the weight of the gun is marked 5579 lbs., and the sleds supporting it, together with the timbers, lashing chains, wedges, blocks, &c., weighed, in all, 1624 lbs., one sled weighing as much as the other. 3d. That the horses and their sled were so far in advance, the pressure arising from this cause may be neglected, in as much as it did not act at the same time, and upon the same ice, with that arising from the gun.

Therefore, the whole pressure sustained by the 6.458 square feet of ice, at the same time, was equal to 5579+1624 lbs., or equal to 7203 lbs.; and admitting, what was very nearly the truth, that the pressure was distributed uniformly, and dividing 7203 by 6.458, we shall have 1115.361 lbs., for the pressure sustained by each square foot; at all events, 1115.361 lbs. will be the *average* pressure sustained by a square foot of the ice.

From the observed effects upon the fifty paces of ice at the entrance of the creek, one can form a pretty accurate estimate of the *least* thickness upon which we can *safely* bring a pressure (of 1115.361+10) equal to 1125.361 lbs., (the ten additional pounds being the allowance for the covering sheet of water.) It is evident that the ice will *not be safe*, if its thickness be not above 5.56 inches.

From the foregoing facts, which were obtained with the greatest care, it may be inferred, 1st. That a load may be transported with perfect safety over sound ice, eight inches in thickness, by distributing the entire weight of the system, so that each square foot (in contact with the bottom surfaces of the runners) shall experience a pressure of not more than about 1115 lbs. 2. That a load *cannot be safely* transported over sound ice, 5.56 in thick, when the weight is so distributed, that each square foot of surface (in contact with the bottoms of the runners) shall experience a pressure so great as about 1125 lbs.

PROGRESS OF THE IRON RAILROAD SYSTEM IN GERMENY.—The road from Nuremburg to Furth will be opened this

month; and from Dresden to Leipsick is in construction; that from cologneto the Belgian frontier will probably be commenced immediately after the next meeting of the shareholders, which is fixed for the 25th instant. For those from Elberfield to Roer, and from Elberfeld to Dusseldorf, subscriptions are opened. That from Minden to the Rhine is under consideration, Its importance, in a military point of view, leaves no doubt of its being shortly undertaken. It will unite the Weser with the Lippe, and will join the Rhine in two places (Dusseldorf and Deutz) opposite Cologne. That from Berlin to Pottsdam is decided upon, and will serve as a model for the other Railways in Germany. It will be laid by the best engineers of Berlin. For the roads from Berlin to Leipsick, from Berlin to Magdebourg, and from Magdebourg to Leipsick, subscriptions of 14,844,400 francs have been received, and they will be encouraged by the Prussian government. The projected Railroad from Berlin to Stettin is favored by the hereditary Prince of Prussia. The following are under consideration; From Hanover to the Elbe—from Bremen to Hanover—From Stuttgardt to Carmstadt—from Frankfort to Mentz—and from Manheim to Basle. That from Newstadt, in Holistein, to Altona, has been decided upon by the Danish government, In Austria, two gigantic undertakings are in contemplation—a road from Vienna to Lemburg, in Galicia, and another from Vienna to Trieste, in the Gulf of Venice The first will have to run in a direct line, by the map, 100 Belgian leagues, of 20 to a degree, and the second, a distance of 60 leagues.—[Paris Advertiser.]

For the Railroad Journal.

No II.

Intelligent citizens of New-York, have you the map of New-York, New-Jersey, and Pennsylvania before you? Place one end of a piece of tape at Buffalo; extend it to New-York city; observe! The tape runs over, and nearly covers the whole line of the Susquehanna river from Bath down to Pittston. Do you see how exactly in a line from your city to Buffalo the Susquehanna lies? Does it run as if nature had placed that stream in its actual position to cut through the chains of mountains that intervene, on purpose to enable your State to make a railroad along its banks to connect your city with the Lakes? From Bath, a railway, it is believed, might be made to Pittston so easy and regular in its descent that cars could come all the way by their own gravity, if this were desirable.

To some, what I am about to state is probably known: to others it may be news; and if they have a lively interest in the growth of New-York, it cannot fail to be interesting news. Already a charter had been obtained for making a railroad from Elizabethtown to the Pennsylvania line, pointing towards Pittston. (Without professing to understand the thing minutely—the ground the obstacles &c.—it would appear to me the route surveyed is too crooked; but this must be looked into.) From the Pennsylvania line another charter had been obtained for a railroad to Pittston. A railroad had been, for several years, authorized, from Pittston along the Susquehannah up to the New-York State line. Now for the interesting fact:—Last fall, gentlemen of honer, worth, and character, came forward by their agents, took up stock encugh to secure the charter of the last named road, deposited ten thousand dollars, and got the charter. So that now the charters actually exist for a continuous line of railway from opposite your city, through the anthracite coal region of Luzerne, at Pittston, along the Susquehanna, to the New-York State line, in a direct course to Buffalo. I suppose I need not say that when you reach New-York State at Newtown, you may go on northerly to Buffalo, or westerly to Portland, or both. I need hardly tell you that this route, besides passing through the anthracite coal region at Pittston, from whence coal will be sent both ways, is about SIXTY MILES nearer than any other practicable, between your city and Lake Erie.

My purpose has been, in the briefest space possible, in two short numbers—so short that every intelligent man, however hurried, might take time to read—to place the subject in a general view before you.

Now, Mr. Minor, we want from some writer who has leisure and ability, this subject taken up in a course of numbers, and fully set forth in all its details and ramifications:

1st. The extent and importance of the trade between New-York and Lake Erie, and the intervening country, in which the growth of the country around the upper Lakes, Erie, Huron, Michigan, Superior, and those vast inland seas, should be fairly considered.

2d. The railroad—its directness; the rapidity of passenger cars; the expedition of burthen cars; the time required for merchandize to pass from New-York to Buffalo or Portland by this route; and the circumstance that the railroad would be open the whole, or nearly the whole year.

3d. The coal trade, both ways, always and every where profitable, reducing therefore the cost on the carriage of merchanlise, and giving to your city great advantages in the trade of the north-western Mediterranean.

4th. The cost of construction; the necessity for immediate action; how much the State ought to subscribe—how much the City Councils—how much the citizens of the city—how much the inhabitants of the route—and whether the United States any thing.

Together with such other considerations as should present themselves.

CLINTON.

The following charter appears to have been framed in accordance with the recommendation of Mr. Schermerhorn, whose letter we pnblished in our last. It is worth a careful perusal.

Extract of a letter received by the Ivanhoe dated

TUSCALOOSA, Jan. 7th, 1836.

"The bill creating a bank, to be located in Mobile, with a capital of five millions of dollars, (two fifths of which is reserved for the State,) as passed by the House, was passed in the Senate to-day. It only requires the signature of the Governor to become a law. The 'Life Insurance and Trust Company' bill has passed the House of Representatives, and will, this evening, no doubt, pass the Senate. The capital is one million of dollars. A bill has passed, finaly, incrasing the capital of the Branch of the Bank of the State at Huntsville five hundred thousand dollars. A bill has also passed the Senate, to increase the capital of the Branch at Mobile one million nine hundred thousand dollars, and the Branch at Montgomery, seven hundred thousand dollars, which will be passed by the House, no doubt, this evening. *Three millions more to be placed in our banks*, for the purpose of making a Railroad. A bill has passed the House of Representatives, almost entirely abolishing taxation."

The vote in the Senate upon the passage of the Mobile Eank bill was 18 to 11.

Section 2. And be it further enacted, That the capital stock of said company shall be three millions of dollars, in thirty thousand shares of one hundred dollars each, to be subscribed for by citizen of the State of Alabama, and by them only.

Sec. 3. And be it further enacted, That the aboved named Commissioners, or a majority of them, as soon as practicable, after the passage of this act, shall cause books to be opened at the Court House in each county in this State, for the purpose of receiving subscriptions to the capital stock of said company, after having given notice thereof, in all the principal newspapers published in this State, at least thirty days: and upon the opening of said books, they shall be kept open for twenty successive days, (Sundays excepted) from 10 o'clock A. M. until 2 o'clock P. M., upon the expiration of which time, the books shall be closed, and on closing the books should the subscriptions amount to ten thousand shares, or upwards, the above named Commissioners shall constitute and form a Board of Directors, to manage and conduct the affairs of said Company, for and during the space of one year, and until the arrival of the period of the annual

election by the Stockholders, and a new Board be duly elected; that the said directors, together with the subscribers and those who may hereafter become associated with them, their sucessors and assigns, shall constitute a body corporate, and they are hereby incorporated, under the name of the Mobile and Tennessee Railroad Company. * * * *

Sec. 4. And be it further enacted, That the subscribers for the stock shall, at the time of subscribing, or as soon thereafter as may be thereto required by the Commissioners or Directors, present to them the titles of the property upon which they have subscribed for stock, and which they propose to mortgage for that purpose, in order that the same may be examined by the Counsel of the Company, and reported upon, previous to the distribution of the Stock.

Sec. 5. Be it further enacted, That the Governor shall appoint three Appraisers in each county in the State, who shall be resident freeholders, whose duty it shall be, on application of any person interested, who may have subscribed for stock, to repair to the place within their respective counties, and make a fair cash estimate of the property of such subscriber, reduce the same to writing, specifying the kind and description of the property clearly; and the said appraisers, or a majority of them, shall assign the same, and shall append thereto their oath, that the same is a just estimate according to their best judgment; which appraisment shall be delivered to the party interested, to be by him transmitted to the Commissioners Directors, or as the case may be) and each appraiser shall be entitled to receive from every such applicant, for whom they shall make such appraisement, the sum of one dollar each, and the additional sum of three dollars for every twenty miles they may travel in going to and returning from such appraisements, and should any appraiser resign, die, orrefuse to act at any time before the duties assigned him by this act shall have been completed, his place shall be forthwith filled by the Governor.

Sec. 6. And be it further enacted, That upon closing of the books of subscription, should the amount subscribed be sufficient to organize the Board of Directars, they may proceed to distribute the stock and receive the mortgages from subscribers, and issue their stock certificates. Provided, that such mortgages shall not be taken on any other than real estate. The mor gages shall be taken for double the amount of the stock taken by each subscriber, and shall be given to secure the payment of the principal and interest of the bonds which may be received by the Company from the State under their charter. And the mortgages shall be in such form as the Governor of the State and Attorney General shall prescribe, and shall be made to the Governor for the time being and his successors in office. Upon the first opening of the books as aforesaid, should the amount subscribed exceed the amount of the capital stock or thirty thousand shares, the same shall be reduced to that number by striking off from the largest number of shares in any one subscription until the reduction is effected. Provided, that five thousan shares of the capital stock of this Company shall be reserved to the corporate authorities of the city of Mobile, and for which the State shall not issue their bonds.

Sec. 8. And be it further enacted, That upon the stock being taken and justly distributed, and the mortgages given and duly recorded, and the certificate deposited in the State Bank, the Governor shall, upon the application of the Directors, or a majority of them issue the bonds of the State for the amount of said capital stock, in sums not less than one thousand dollars each, payable to the Company twenty years from date, drawing interest at five per cent. par annum, payable semi-annually, in the following form:

"To wit:"

"One Thousand Dollars."

"Know all men by these presents, that the State of Alabama acknowledges to be indebted to the Mobile and Tennesee Railroad Company in the sum of One Thousand Dollars, which sum the said State promises to pay in current money of the United States of America, to the President and Directors of said Company, on the in the year with interest at the rate of five per cent. per annum, payable half yearly at the place named in the endorsment hereon. To wit: on the of every year until the payment of said principal sum.

"In testimony whereof, the Governor of the State of Alabama has signed, and the Treasurer has countersigned these presents, and caused the seal of the State to be affixed thereto, at Tuscaloosa, the Seat of Government, this in the year of our Lord

Governor.

Countersigned, Treasurer.

The said bonds shall be transferable by the endorsement of the President of said Company to the order of any person, or to bearer; and the said endorsement shall fix the place the said interest and principal of said bonds shall be paid by said Company as the same shall become due and payable.

Sec. 9. And be it further enacted, That in order to secure the State in the payment of the interest and principal of the bonds, by the Company according to the provisions of this charter, all the mortgages given by the stockholders, amounting to double the amount of the bonds aforesaid; and also the road constructed by the company, with all its fixtures, shall remain pledged to the State until the entire extinguishment of the bonds shall have been effected, or satisfactorily provided for, and no transfer or release of said mortgages by the Company shall be valid, except such as are herein provided for.

Sec. 10. And be it further enacted, That in order, farther to insure the payment of said bonds, interest and principal, as the same shall become due on the part of the said Company, the entire nett profits of said road, as the same shall accrue, shall be deposited in the State Bank of Alabama as a sinking fund, to be applied exclusively to the payment of the bonds aforesaid. And no distribution of dividends shall be made among the stockholders until said funds shall reach the amount of the aforesaid bonds. That the said Bank and Branches shall allow the said Railroad Company an interest upon such deposites five per cent. per annum, which shall be payable semi-annually, and if not drawn for, shall become principal as the same accrues. The funds also arising from the sale of the State bonds shall also be deposited with said Bank and Branches, to be drawn for, however, by the Company as the same be required in the construction of the road and works thereto appertaining. And whenever the said Company shall deposit money specially for six months or upwards, the bank and Branches shall pay like interest thereon as is provided for in regard to the sinking fund.

Sec. 12. And be it further enacted, That no mortgages shall be received upon any buildings situated upon city or town lots, unless such buildings be insured by the owners and the policies be transferred to the Governor of the State of Alabama and his successor in office, and should the policies not be regularly renewed and transferred as aforesaid, the stock taken upon such buildings shall be forfeited to the Company, to be disposed of as is provided for in the eleventh section of this act.

Sec. 13. And be it further enacted, That should the Company fail, neglect, or refuse to pay the State bonds aforesaid, interest and principal as the same shall become due and payable, this charter shall be forfeited and the mortgages which have been taken for stock, shall enure to the benefit of the State, and the property mortgaged may be proceeded against, seized and sold for the amount of said bonds, or such portion thereof as the Company may have failed to pay. Provided, however, that the road hereby authorized to be constructed, with all its fixtures and appurtenances thereunto belonging, shall be held first liable for such defalcation, and may be proceeded against, seized and sold, under the pledges contained in this charter, or such portion thereof as may be necessary to meet such defalcation.

Sec. 17. And be it further enacted, That at the regular annual meetings of the stockholders of said Company, it shall be the duty of the President and Directors in office for the preceeding year to exhibit a clear and distinct statement of the affairs of the Company under such penalties as may hereafter be provided by law. And also at any called meeting of the stockholders a majority of those present may require similar statements from the President and Directors, whose duty it shall be to furnish them when thus required, and at all general meetings of the stockholders, a majority in value of all the stockholders in said Company may remove from office any President or any of the Directors of said Company, and may appoint others in their stead, but this power shall not extend to the removal of any Director appointed on the part of the State. Nor shall any thing be construed to authorize the State to continue their appointment of Directors, after the

extinguishment of the State bonds are made, or are provided for to the satisfaction of the General Assembly. But thereafter the whole number of Directors shall be chosen by the stockholders, as provided for in the fifteenth section of this act: Provided, however, that whenever the dividends of said road, deposited in Bank, shall be equal to the amount of the bonds issued by the State, the property hereby mortgaged to secure the State, shall be released, and the stockholders be entitled to all the interest and benefits of said road, as if no pledge or mortgages had been given.

Sec. 19. And be it further enacted, That the President and Directors of said Company shall be, and they are hereby invested with all rights and powers necessary for the construction, repair, maintenance, and use of a Railroad from the city of Mobile, or from any navigable point on the waters of Mobile Bay, (provided that said road shall not cross the Tombecbee river above McCrew's shoals,) to some point on Tennessee river, thence north to the Tennessee line. The said road not to exceed one hundred feet in width, with as many setts of tracks as the President and Directors may deem necessary: Provided however, that in passing hills or vallies, the said Company may be authorized to extend said width, in order to effect said object, and the said President and Directors, or a majority of them, may cause to be made or constructed, or contract with others, for making said Railroad or any part thereof, and they, their agents, or those with whom they may contract for making any part of the same, or their agents, may enter upon, and use, and excavate any land which may be wanted for the purpose of said road, as well as in the erection of ware-houses or other works necessary for said road, or any other purpose necessary or useful in the construction and repair or maintenance of said road or its works, they may build bridges, viaducts, and may lay rails, take and use any timber, earth, gravel, stone shells, or other materials, then being in their natural state or condition, that may be wanted for the construction, repair, or maintainance of any part of said road or any of its works, and may make and construct all works whatever, which may be necessary and expedient for the proper completion of said road and its successful operation: Provided however, that if the said road should cross any navigable stream, canal, or other water course, the said road shall be so constructed and arranged as not to obstruct the free navigation thereof, and it shall and may be lawful for the Company to extend a Railroad or roads to any point within the incorporated limits of the city of Mobile, with like rights and priviledges: Provided, always, that said Railroad shall be so constructed as not to prevent the use of travelling on the streets: and Provided also that said road shall not pass through any of the streets of said city, without the consent of the corporate authorities thereof first having been obtained, and that if this Railroad is not commenced in two years and completed in ten years after the receipts of the proceeds of the State bonds, so as to transport freight and passengers throughout its whole extent, unless further time shall be granted by law, this charter shall be forfeited, and the stockholders shall forfeit and pay to the State of Alabama, the sum of two hundred thousand dollars, which shall be recovered on motion in the Circuit Court in any county within this State: Provided, however, that the President and Directors shall first complete said road north of the point at which it shall strike the navigable waters of the Mobile Bay.

Sec. 20. And be it further enacted, That the said President and Directors shall be authorized to contract for and receive conveyances for any land, stone gravel, or other materials henceforth, which may be necessary and required in the construction of said Railroad, and when the owner and the Company cannot agree, or when the owner is an *infant* or *non compos mentis*, then it shall be lawful for said President and Directors to apply to any Justice of the Peace for a warrant directed to the Sheriff of the county, commanding him to summon a jury of seven disinterested freeholders, a majority of whom shall be authorized to assess the damages under the same rules and regulations now established by law in cases of other roads; said jury shall forthwith assess the value of said land, stone, gravel, or other materials, &c., subject to the right of an appeal to the Circuit Court by either party who shall think themselves aggrieved; when the trial shall be *de novo*, by a jury as in other cases, and the Sheriff shall return the same to the office of the Clerk of the County Court of the proper county, and at the next term of the Commissioner's Court, the same shall be affirmed, if no objection, and if the Court shall set the same aside, said Court shall order a new writ, and an assessment made in pursuance thereof, shall be final, and the land, stone, gravel, lumber, &c., so contracted for or condemned, shall enure to the said Company, upon the payment of the said money to the persons contracted with, or into Court as the case may be; and the whole proceedings shall be entered on record in said Court at the expense of said Company; Provided, however, that the said work shall in no wise be delayed on account of the proceedings had as aforesaid, but the said Company, on tendering the amount to which the land, stone, gravel, or timber shall have been, valued, to the owner, or depositing the same in the office of the Clerk of said Court, may proceed with the work as if there had been no appeal: And Provided, also, that no right shall exist in said Company to pull down or remove and dwelling house, without the consent of the owner thereof: Provided, that in all cases when it shall become necessary to assess the value of property for the use of said Railroad Company, the jury trying the same shall take into consideration the advantages and disadvantages for and against the individual or Company, and render a verdict in acccordance thereto.

Sec. 21. * * * And be it further enacted, That the Company shall have power to place on any railway, constructed under this act, all machines, locomotive, vehicles, cars, or carriages of any description whatever, which they may deem necessary or proper for the purpose of transportation on said road, of goods, produce, merchandise, or other property and passengers, at such rates as the Company shall think proper to fix; Provided, however, that the rates shall be so fixed as not to allow annual dividends upon the nett profits of more than 10 per cent. per annum, from the time the money upon the State bonds is received; and the said road or roads, with all their works improvements, and profits, and all the machinery of transportation are hereby invested in said Company, incorporated by this act, and their successors forever. The capital stock of said Company shall be forever exempt from taxation, and all their other property of every kind and description, necessary for said work, including the road and rails, shall be exempt from taxation for and during the period of fifty years from the passage of this act, but no longer.

Sec. 22. And be it further enacted, That after the payment of the State bonds shall have been provided for, the Board of Directors shall annually or semi-annually, declare and make such dividends as they may deem proper of the nett profits arising from the receipts of said Company, after deducting the necessary, and current, and probable contingent expenses thereof.

Sec. 24. And be it further enacted, That the Board of Directors of said Company are hereby empowered to accept from any other State such powers and privileges as may be offered to said Company for the continuance of their road within their limits.

Sec. 26. And be it further enacted, That at the expiration of fifty years from the completion of said road the State of Alabama shall be authorized to take the whole of said work as the property of the State upon the payments to said Company of the actual cost of said road, and other property belonging to said Company. If the State of Alabama should so elect to do, within one year after said term and if the State should not elect so to do the said charter shall stand renewed for ten years from the expiration of said fifty years; at the expiration of said term of ten years, the State shall again have the same privilege; and if not taken at the expiration of ten years, the right is hereby reserved to the State successively for every five years, from term to term; and if not taken the charter shall stand renewed to said Company.

Sec. 27. And be it further enacted, That the President and Directors of said Company shall be and they are hereby invested with all rights and powers necessary for the construction, repair and maintenance, and use of a Railroad, branching from the main route at some convenient point, running in the most eligible route towards Brown's Ferry above the Suck, on the Tennessee river; and they shall also have power and authority to connect said last mentioned road with the Alabama river at the most suitable point, to be designated by

the Company; and said branch roads shall be subject to all the provisions provided for the construction of the main route: Provided, that the Legislature shall have the right to authorize any other company to construct the road contemplated by this section.

We subjoin an interesting account of the London and Greenwich Railway. The idea of a viaduct instead of embankment, or of the more old fashioned way of conforming as nearly as possible to the surface of the ground, is novel, and the plan of turning the arches into offices, houses, &c., droll; but the calculations in regard to the income to be derived from renting such offices, &c., is most extravagant. A house without a chimney, and with an everlasting rumbling of locomotives overhead, is not the most desirable location for a man of business or leisure.

From the London Mechanic's Magazine.

THE GREENWICH RAILWAY.—This Railway, it is well known, is to proceed from near the foot of London Bridge on a viaduct 22 feet high, supported by about 1000 arches, to Deptford and Greenwich. In so short a distance as 4 mile, great differences in the under soil were hardly to be expected. However, substrata of clay, gravel, sand, peat, bog, and floating land, seem to have presented themselves in luxuriant variety, the best soil often in juxta-position with the worst. But with these the engineer has successfully contended, so that it would require a professional eye to discover any effect of settlement out of 575 arches already built.* In general, the arches are a segment of circles; but almost every species of arch in use, except the Gothic, is pressed into service as circumstances need. The eye is occasionally arrested by an arch commencing with the segment of a circle, and when looked through, presenting a parabola or part of an ellipse. Professional men well know the difficulties of such oblique structures, yet, as far as I could perceive, there was no deficiency of symmetry or regularity, while the transition of figures seized the mind with its pleasing effects. The prevailing character of the work may be summed up in uniform neatness and strength without heaviness.

For the purpose of additional security, cross walls are built between the arches, over which the rails are to lie for the trains, and the intervals are filled with concrete. By this means the mass is rendered one solid piece, and the weight of the carriages is spread over a large space.

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* Lest my friend Sir John Rennie should again hazard an expression that I am "unacquainted with the engineering details," I must here beg to observe, that a few of the piers on each side of the abutments supporting the elliptic arch over Earl's sewer, nod a little towards the sewer, from a circumstance of which it is necessary to go into the "engineering details," but I will if Sir John wishes it.

It seems to be a favorite maxim with Colonel Landmann, the engineer, that wherever the lead is long, a viaduct is generally more economical than an embankment. Without implicitly subscribing to this doctrine, in which there is often more truth than some civil engineers are willing to admit, it is evident that embankment in the Greenwich Railway would have been little short of insanity. Putting out of the question the enormous expense of forming it where all the materials have to be raised to the embankment, not to be drawn out on a level, and of the additional ground to be purchased, both for the embankment and materials; setting, I repeat, all this aside, together with the immense rental which must ultimately result from nearly 1,000 manufactories, shops, houses, and warehouses, into which the arches are being converted, it is probable that long before such an embankment of 22 feet high could settle into a road fit for locomotive travelling, the Colonel's viaduct will be finished, and likely enough return a large portion of the capital expended.

At the Deptford end several of the arches are now occupied by the company for smiths', carpenters and other shops, which must obviously be a great saving to the concern. One or two of the arches are also tenented as public houses. Over two made into two five-room private houses, I have been, and I must confess, contrary to my expectations, I found them comfortable, roomy, and compact. The inconvenience I anticipated in my former communication from smoke, is removed by the use of gas stoves, with which the houses are furnished. In the neighborhood of London many of these arches will doubtless be let for offices, vaults, and warehouses. I have heard that 500*l.* per annum have already been offered for some between Joiner-street, and the bridge terminus. At all events, it will be the manager's fault if ultimately they do not turn in a large revenue. It is said there will be about 1000 of them, which some calculate will fetch 30*l.* per annum each; or, on the whole, a rental of near 30,000*l.* per annum. But suppose only 900 of them let, and at 20*l.* each, the rental will be 18,000*l.* per annum, or 2,000*l.* annually more than the interest of the whole capital (400,000*l.*) at 4 per cent.; a tolerable argument that the engineer had here a good reason for preferring his viaduct to a profitless embankment.

The following eviednce of Dr. Lardner on the "Great Western Railway Bill," will be found to contain many items of interest and amusement to our readers.

We suspect that some of the learned Doctor's opinions on the question of Railroad "inclines," will not receive a very ready assent from many of our civil engineers. However, the whole is worth a perusal; and if the parts of the examination in relation to "noxious air," do not excite a smile, our readers must be of different material from ourselves.

We shall con inue it in our next.

From the London Mechanics' Magazine.

EVIDENCE OF DR. LARDNER.

On the Great Western Railway Bill.

3d of August, 1835.

The Earl RADNOR in the Chair.

DIONYSIUS LARDNER, LL. D., being examined, gave evidence as follows:

You have heard a good deal said in extenuation of the Box tunnel; what is your opinion upon that subject?—The combination of a tunnel with a slope appears to be the objection to it; and the power requisite to pull a load up a slope of 1 in 107 is greater than the power necessary to pull the same load on a level in the proportion of 30 to 9.

In round numbers, nearly 3 1-2 to 1?—Yes; it requires 9 lbs. per ton to pull a load on a level line, and requires 30 lbs. to pull up 1 in 107.

Applying your attention to the question of the tunnel, in what way is that difficulty aggravated beyond the mere proportion of the great power required?—The increased power necessary for a slope must be produced by a proportionably increased consumption of fuel; that will produce a proportionable increased destruction of atmospheric air; and of course, if the tunnel be intended to be kept as pure on the slope as it would be necessary to keep it on a level, the transverse section of the tunnel ought to be greater on a slope than on a level in the proportion of 30 to 9.

Mr. Joy.—Your attention has been called to railways in various parts of the world; do you know of any parallel to this, uniting the length of tunnel with that inclination?—No, I am not aware of any.

Is it justifiable, except in a very extreme case, to unite those two disadvantages, such a length of tunnel with that inclination?—I think nothing but an overruling necessity could justify it.

Have you considered the different modes proposed for working that tunnel; additional locomotive power or a stationary power, either by an endless rope or a single rope?—Yes.

Have you also considered it as worked partly by the one and partly by the other?—Yes, it might be worked partly by one and partly by the other; the tunnel is not the same length as the slope; the slope is two miles and a half, and the tunnel a mile and three quarters in length; it might be worked by a rope through the tunnel.

First, as worked by locomotive engines, what would there be its great objection?—I think I have stated its great objection already; the probable difficulty attending the destruction of air by the fire; and in considering that it appears to me that it ought to be considered, not so much with regard to the positive injury that may be produced to the health or life of the passengers—I do not think there would be any—but with regard to the unpleasantness and inconvenience arising from the existence of a quantity of noxious vapor through which they would be carried.

That is an objection more or less appli-

cable to tunnels upon a level?—Less applicable to them, because there would be less power requisite.

Would the atmosphere of the tunnel be injuriously affected and impregnated with the gases produced by the combustion?—Not injuriously, but inconveniently, I think.

You have stated that there would be so much greater power required, and that requiring a greater proportionate quantity of combustion, that the ill effects would be produced in that proportion. What would be the proportion of increase in the consumption of fuel?—As 30 to 9.

In the same proportion as the increase of power?—Yes.

Mr. Joy.—Would there be as much air consumed in that tunnel as in a tunnel on a level of five miles and four-fifths long?—Yes, nearly. The length of the tunnel would be in the proportion of 30 to 9; there would be as much air consumed in this tunnel as there would be in a level tunnel longer in the proportion of 30 to 9.

Do you think any method of ventilation could be attainable that would render it otherwise than almost intolerable?—I scarcely think that the common mode by shafts would do it.

I have asked you whether it was actually practicable; is it not a feature devoutly to be avoided?—Yes.

To be avoided at almost all hazards?—Yes.

Would it be an eligible thing, such a tunnel in the course of a line, or almost intolerable?—I think it could be justified only by overruling necessity.

Mr. Joy.—Is this grieviance much the same, or very materially aggravated, by such a tunnel and such an inclination being in the middle of the line rather than at the extremity?—Yes, it is more objectionable than at the extremity.

Why?—Because of the unpleasantness, and the interruption to the transit of the trains when the passengers are in them; you come to a stand-still; they must undergo a change in the moving power, and a similar change takes place at the top. At the end, if there is a tunnel, passengers hardly consider they have started until they have already passed through the tunnel; that is the case upon the Liverpool line, where there is a short tunnel at starting; no one could have travelled that line without feeling that had that tunnel occurred at Rainhill instead of where it is, it would have been felt a much greater inconvenience, though the absolute loss of time might not be more.

Supposing Mr. Brunel shall have said, in answer to a question as to the danger of the atmosphere being rendered noxious by the passage of the engines, "I think not; there is one in existence upwards of a mile, and another on the Birmingham line;" and again, when asked, "Is the inclination so steep?" if he should have said, "It will not affect the atmosphere," is that correct or erroneous?—I think Mr. Brunel is in error there; it would effect the atmosphere.

In point of fact, is it not true that there will be an additional difficulty, as to the ventilation, from the increased power that will be requisite?—It will require more ventilation in the proportion of 30 to 9.

If it is assumed by the engineers on the other side, there will not be more ventilation required than on a level, that is an oversight, in your judgment?—Yes, that is an oversight, I suppose.

Supposing coke used instead of coal would not the gas produced be more noxious?—No, not more noxious; it is the same gas, the combustion of coke produces carbonic acid gas, sulphérous acid, and azote. Coal would be quite inadmissible.

Mr. Joy.—Would not the gas that would escape from coke be of a more injurious nature if it existed in any quantity?—Yes; it is not only gas that escapes from the combustion of the coke, but the gas that is decomposed in the atmosphere would be more injurious.

Would not this gas, unless it found a vent in a heated state, be likely to remain?—Yes, from its specific gravity: it is half as heavy again as the atmospheric air; the carbonic acid gas.

That is the offensive gas of which you speak?—Yes, the gasses are mixed together, and if they cool they are heavier than the atmosphere, and apt to remain.

The mischief must very much depend upon the quantity; is not the carbonic acid gas what the miners call choke damp, in a great degree?—Yes, it is what exists in wells and in the Grotto Del Cane.

If it is an excessive quantity, it is fatal to life?—Yes.

The degree of injury, if any there be, must depend upon the proportion?—Yes.

It may be diluted with common air, so as not to be fatal to life or health?—Yes, there is always a quantity in the air.

If the extra power is supplied by a stationary engine, the consumption of fuel would not be greater in the tunnel?—No.

Mr. Joy.—Have you made calculations of the proportions of these gases?—Yes; of the proportions of foul air to be produced.

Without troubling you to go into it in any detail, could you tell us the different gases you think injurious; the round sum of them produced in the passage through this immediate tunnel, for a load of 100 tons in a tunnel of a mile and three quarters long, upon a slope of 1 in 107? Have you calculated the quantity of noxious gas that will probably be made?—Yes; the total quantity, taking for granted that it takes half a pound of coke per ton per mile upon a level to draw a train, which, I believe, is in practice nearly the case, the quality of noxious gas produced in this tunnel would be something less than 4,000 lbs. weight, with a load of 100 tons.

Every time a train goes through?—Yes.

Mr. Joy.—Does any objection exist with regard to the assistant engine on the Manchester and Liverpool line; they have one there?—Yes; not in a tunnel.

I am speaking of the inclination; is there not an inclination on that line very near this?—Yes; 1 in 36.

Is there any practical inconvenience here, as you have observed the line so frequently, with reference to the additional engine?—The additional engine is not always ready to assist the train, and they have sometimes to wait.

Have they sometimes to wait from its being out of repair?—They have delays from various causes; it may not be lighted, or it may be employed upon one train, when wanted for another.

Have you known trains come to a dead stop on that inclined plane?—Yes; I have been upon it more than once when that has happened.

Have you had to wait a considerable time?—Yes until the engine could be got.

Would the extra cost necessary for keeping this engine ready for use be another objection?—Yes; they would be always obliged to keep it ready for use, whether wanted or not.

I will call your attention to another mode mentioned, that of the endless rope; have you made a calculation of what would be the result if that system was practised?—Yes, I have.

What on the Liverpool and Manchester line, where they have a slope of 1 in 48, is the one they use?—That slope is 2,000 yards long, and the rope they use is a six inch rope, to draw loads of twenty-five tons.

At the rate of about ten miles an hour?—I do not think the rate makes any difference in the strength of the rope.

Is that the rate?—Yes.

What sort of a rope would the Box tunnel require, taking the Liverpool one as the basis of your calculation?—I consider it will require a seven inch rope.

What would be the weight of a 7 inch rope per yard?—I believe the weght of a seven inch rope would be six pounds and a half per yard.

What would be the total weight produced?—The total weight of that endless rope would be about 57,000 pounds.

How long?—About five miles.

Mr. Joy.—Calculating the friction of such a rope thus worked at about a twelfth of its weight, which was the proportion given by Mr. Stephenson and Mr. Locke, what pull would it require to work a train of fifty-two tons?—To propel fifty-two tons upon a slope of 1 in 107 will require for its gravity a 107th part; you are to divide the 52 by 107, and you will get the power of draught necessary to overcome the gravity of the load.

What would that be?—1,088 lbs.; then there would be the friction of the load, which is at the rate of 9 lbs. per ton, which for fifty-two tons, 468 lbs.; these two together would come to 1,556 lbs.; that is exclusive of the rope. Then the experiments of Mr. Stephenson and Mr. Locke on the friction of the rope shows us, that the friction may be taken at about a twelfth part of the weight of the rope; and those experiments appear to me to be very satisfactory and conclusive; there was an average of several taken, and they have given very nearly the same result; and taking one twelfth part of 57,000 lbs. you will get the force necessary to pull the rope, which alone is 4,752 lbs.; the load therefore would require 1,556 lbs., and the

rope 4,752 lbs., making a total of 6,308 lbs.

Is not the result of this calculation, that it would require about three times the power for the rope compared with the load?—Yes; for a load of fifty-two tons it is in the proportion of 15 to 47, very nearly.

To move that at the rate of fifteen miles an hour would require what power as expressed in horses?—Twenty-five pounds pulled at the rate of fifteen miles an hour is equal to one-horse power, and therefore 6,300 lbs. pulled at that rate, would be equal to 252 horse power.

Have you a corroboration of that result from the proposed engine on the tunnel now making on the Liverpool and Manchester railway?—The tunnel for passengers is a tunnel of a mile long, I think.

What is the power of the engine there proposed?—It is, they say, 140-horse power.

That is for the passengers only?—Yes, for light loads.

What is the declivity there?—1 in 100.

Very nearly the same as here?—Yes.

Mr. Joy.—Is that consistent with the calculation you have just been giving to the Committee?—Yes, it agrees very nearly with it, as nearly as possible. I should state it would be necessary to have two engines, one to work while the other is accidentally deranged or repairing, otherwise the whole traffic up the road will be stopped; there must be a pair of engines.

May not that be estimated at a lower tonnage in consequence of its being intended for passengers only?—Fifty tons is the amount of an ordinary load of passengers, including carriages.

Is not that about half the length of the Box tunnel?—Yes, it is about a mile long.

Is it correct to suppose that a five and a half inch rope would be sufficient for the Box tunnel, because the incline is flatter than the tunnel upon the Manchester and Liverpool Railway of 1 in 48?—No, because the length is there omitted; the length is a very material consideration; it is a much more material consideration than the degree of acclivity.

Would the calculation of the sufficiency of a rope, a five and a half inch rope, be conclusive if it was applied to so much shorter a line?—No; the acclivity has nothing whatever to do with the calculation; an endless rope, which would be sufficient for a certain load on one inclination, would be sufficient for any other inclination; the weight of the rope has nothing to do with it; it balances itself.

In order to arrive at a proper conclusion, is it not necessary to take into account the greater length of the line?—Yes, and that alone.

And not the steepness?—Not when it is an endless rope; a single rope would require steepness to be taken into consideration, but not an endless rope.

At the tunnel in question, on the Liverpool and Manchester line, is not the load of the locomotive divided into five or six different portions, and drawn up at five or six different times?—Yes; it is drawn up in loads of twenty-five tons; this would not do in the middle of the line.

Is it comparatively unimportant at the end?—If the load was to be drawn up in that way in portions in the middle of the line, the line would be occupied a considerable time, and the trains of passengers would be stopped until all this business of carrying up the loads was finished; and even at the end of the line, unless the slope was exclusively devoted to goods, it would not do there.

If a load of 100 tons were to arrive at the top of such an inclination, there would be a waste of time in the arrangements necessary to divide it?—It would be divided into four, and then one would be drawn up, and then another.

Whereas 100 tons can be very easily moved upon other parts of the line?—Yes.

Do you happen to know whether the elder Mr Stephenson asserts that an endless rope of five miles long is impracticable?—Yes, I recollect he says that.

Do you agree with him?—Yes, it is within the bounds of mechanical possibility I think, but in the common sense of the word it is impracticable; I hardly think any one would attempt it.

Have you any idea that it would be adopted?—No; the power expended upon the rope would be so preposterously great compared to the load to be drawn.

You consider it, in common parlance, impracticable?—Yes.

Now turn to the single rope. Suppose it is to be worked by a single rope, is it one of the objections necessarily involved in a single rope, that there must be a small locomotive to draw it back?—There must be some means to draw it back again, and the weight is so considerable that the power must be considerable.

Do you consider, speaking of a single rope, it would be but half the length?—Yes

Two miles and a half; would not that require a small locomotive in consequence of its length?—It would require a considerable power, and a small locomotive would do it.

Would not there be some objection to that in consequence of is consumption of vital air in the tunnel?—Yes; that would be an additional inconvenience.

Would not there be some objection to that in consequence of its consumption of vital air in the tunnel?—Yes; that would be an additional inconvenience.

Would it not be a constant expense?—Yes; there would be constant expense in the consumption of fuel.

Is the original cost of such a rope heavy?—Yes.

Is the wear and tear considerable?—Yes.

Has it to be often spliced?—Yes; the rope on the Liverpool tunnel is spliced twice a week, I believe.

Are the sheaves and pulleys that the rope runs upon likely to break and get out of order?—Yes.

What is the number of those pulleys in a mile?—220 in a mile, I think.

Do you know any thing of the cost of those pulleys?—From 15s. to 20s. is the cost, where less power is used.

Would not this mode require about three times the power usually expended?—Yes; I should say in the proportion of 15 to 47 by an enless rope.

I am speaking of a single rope?—There would be less waste of power in a single rope, but we must take into account the power to carry it back.

Would it not come nearly to what I have stated?—I have not calculated that.

Have you any objections to stationary power in the midst of a line like the Great Western?—Yes; there is an objection to it in the interruption it would occasion in the rapid transit of passengers and the change of power; those are sufficient objections to it.

What would be the sort of power necessary to draw up a single rope?—It would be pulled back by an engine attached to the end of a single rope, which would draw it back.

If the load be 100 tons, should you not require a rope nine inches in circumference to draw it up?—That is for an endless rope.

Mr. Talbot states, that an endless rope had never been proposed, from the beginning to the end, by the parties promoting the bill, and that calculations based on the assumption that it was to be used were therefore irrelevant.

Mr. Joy is heard in answer to the observation.

Mr. Joy.—Leaving both the endless rope and the single rope, I wish to call your attention to the breaks. There was an experiment stated by Mr. Brunel on the Canterbury and Whitstable inclined plane. Is that applicable to the Box tunnel? Supposing it to be stated by Mr. Brunel, with reference to the Canterbury and Whitstable Railway, "I have been down that plane twice, without a rope in the carriage, alone, with nothing but a break to check the carriage, and allowing it to run all its full velocity; by the break it was stopped in sixty yards.—How many passengers were in the carriage? We were five only; of course, I did not try an experiment of that sort with many passengers.—Was it fully loaded? No." I would ask you whether that gives at all a sufficient explanation of the practability of stopping such trains as would usually go on such a line as this; upon such an inclination as the Box plane?—No; because the power of the break is inversely as the load; and though you might stop a wagon loaded with five persons (I believe the average weight of a man is 150 lbs., which would be 750 lbs. plus the weight of a wagon,) though it might be easy to stop that with a break, it would require a greater power by the break to stop it with a greater load—a power greater in proportion to the load. You cannot infer much from that experiment.

Supposing the carriages to start from the top of the plane in a state of absolute rest, what resistance would be required in order to limit its speed to 30 miles an hour? It will be the resistance of the same number of pounds per ton, whatever be the

limit of the velocity. The circumstances will be these: a train descending a slope of 1 in 107 has a downward tendency which would be balanced by 12 lbs. per ton; and, of course, whatever the velocity you want to restrict the train to, the break should exert a retarding force, amounting to 12 lbs. per ton.

Taking those data, what resistance would it be necessary to exert through a distance of two miles and a half, 7,558 feet?—To limit the velocity to 30 miles an hour, supposing it to begin from a state of rest, the trains starting from a state of rest at the top, and being allowed to proceed by gravity only, without power, would acquire a velocity of 30 miles an hour after passing over 5,612 feet. Then supposing the break to be applied, so as to check any further increase of velocity, it must exert a force of 12 lbs. per ton in order to do that, and that force must be exerted through the remainder of the slope, which would be 7,558 feet; and the total force would be equivalent to 4,500,000 lbs., raised a foot high.

You have stated that, on the supposition that the train starts from a state of rest; is it not notorious that they constantly do start with a considerable degree of velocity?—They never do start from a state of rest.

At what sort of speed do the trains generally arrive at the summit of such a plane?—At the top of the slope on the Manchester Railway they generally arrive at the rate of 20 miles an hour.

I need hardly ask you whether the increased velocity you have spoken of would not then be much more dangerous?—The velocity would be much more increased if it broke loose from the break.

If Mr. George Stephenson should have stated that the break often fails to act; is he correct in that?—Yes; I have seen it frequently fail on the slopes on the Manchester Railway.

Did you ever find that inconvenience yourself when making experiments on that Railway?—Yes.

On an inclined plain of 1 in 96?—Yes; I have seen it totally fail with a train of goods; it was burnt; the friction burnt it.

Just state the particulars of that?—I was descending the slope of 1 in 96 on the Manchester Railway, with a train of goods; the engineer let the train run down for a considerable time without the break, and we obtained a velocity that appeared to me to be exceedingly dangerous. I ordered him to apply the break, but the break totally failed; it was burnt. A signal was made to us by the road police to stop, but the train did not stop for a considerable distance from the foot of the slope. When we descended we found that the wheel of one of the wagons had broken so that both wheels dragged along the rail during the descent, forming a more powerful break than the common breaks, and notwithstanding this, the train went down with this furious velocity.

Do you know what the velocity was?—I can only conjecture that it was something very great; I should say from forty to fifty miles an hour.

Have you ever had any other misfortune of the same kind in a curve?—Yes, did; I recollect an instance of it in a curve or bend in the line; that was not on a slope; it was nearly level.

State the circumstances?—I was proceeding from Liverpool to Manchester with a train of passengers, and at a bend in the line, where from the flexure of the road, the engineer could not see a great distance before him, it happened that a train of stone wagons was occupying the road in advance; a signal was made to the engineer by the road police to cut off the steam and put the breaks on to retard it; and he alleged that he did so; but the velocity continued to be so great, notwithstanding the breaks, that we came against the train of stone wagons, and smashed them all to pieces; the wagons were broken all to pieces, and the stones thrown about, and the framing of the engine, though of strong iron, was broken.

Did you knock the stone carriages to pieces?—Yes. We were protected by the engine and the springs; some of the passengers were bruised a good deal. There are provisions made in the carriages that carry passengers to protect them from the effects of collision, but there are none in the case of stone wagons.

Was this upon an embankment or cutting?—It took place in a cutting quite sufficient to hide the wagons.

What is the length of the radius of the curve were this accident took place?—It is a very considerable radius.

Mr. Joy.—Do you know the radius at the bottom of Box Hill?—It is stated to be three quarters of a mile.

If you were in a cutting would not that aggravate the difficulty, as you would not see the wagons before you?—Yes, it would.

What is the distance of the curve from the end of the Box Plane?—I believe it is stated to be a quarter of a mile.

In your judgment, is it sufficient to prevent any injury at that distance?—There will be great danger of having undue velocity; and on arriving at the curve, if the break should fail, the engine would arrive at the curve with very considerable speed A quarter of a mile would make very little abatement.

If it should be contended that a quarter of a mile is sufficient to obviate any aggravated inconvenience from the velocity, is that correct?—If accidental velocity, be acquired it is not, but if all precautions are taken there is no danger in arriving at the curve; but upon the trains breaking loose, and acquiring that velocity that the descent would give them, there would be danger.

Is it not objectionable that there should be such a curve at the bottom of an inclined plane?—Yes; it would be better further off.

Though a quarter of a mile is sufficient for the expenditure of the common power, is it not insufficient for the expenditure of the dangerous power acquired by that increased velocity?—Yes, it would be.

In your judgment, supposing the train to be worked by a single rope, and such rope were to break, would there not be great danger?—There would be danger arising from the train being precipiated down.

If it is the opinion of Mr. Brunel, that here would be no great danger if the rope broke and that the slightest resistance of the break would stop it dead, is not that erroneous—I do not agree in that at all; I do not think any resistance would stop a train dead; it would gradually stop it.

Mr. Brunel says he has not calculated the amount of velocity that would be acquired; have you calculated the amount of velocity acquired in falling down these slopes?—Yes.

Just state what it is without any break?—A carriage or train, commencing from the top of the Box Hill Incline, from a state of absolute repose, supposing it not to be propelled by any power, would at the foot of the slope have a velocity of forty-six miles an hour by gravity only, and the time of descent would be six minutes and a half. I omit the small fractions.

That is allowing the friction of nine pounds a ton? Yes, it is.

That is assuming the train to decend with any power whatever, and to commence from a state of rest?—Yes; and if it does not commence in a state of rest, you must add to the forty-six miles an hour the velocity that it had at the beginning.

If it was starting at the rate of twenty miles, it would get up to sixty-six?—Yes.

Would not that be perfectly serious and formidable?—That is a matter of opinion; I am not afraid of those high velocities if the road be straight and level; but the curve which takes place in a quarter of a mile from the end of the plane would render it quite objectionable.

Quite formidable and dangerous?—Yes.

There would not be sufficient space in that quarter of a mile to correct such extreme velocity?—No, nothing like it.

Mr. Joy.—Suppose it is contended that the danger was reduced to nothing almost, because it was in cutting?—The difference only would be this, that if they were thrown off the rails, they would not be thrown over an embankment, but against the side of the cutting; there would a difference of result likely to arise, but not a diminution of the chance of being thrown off the rails.

Mr. Locke states he descended the tunnel on the Liverpool and Manchester when the break was not applied at all; have you calculated what must be the speed there?—Supposing the wagon to descend from a state of rest at the top of the tunnel (I speak of the tunnel for goods, 1 in 48,) the velocity acquired at the foot would be fifty-four miles an hour.

If Mr. Locke should represent that to be not accompanied with danger, must not it have been in consequence of previous precautions specially taken on the occasion?—Yes, oh certainly; because accidents have happened where the trains have broken loose in that tunnel, and the wagons have been all smashed to pieces.

Is there to some extent a natural tendency for the engines to get off the rails produced by the centrifugal force upon such a curve as that you have mentioned?—Yes, there is; and for that reason curves are

inadmissible, except with a very large radius. When a body is moved in a circle it has a tendency to fly from the centre, and this tendency in the case of trains on a railway presses the wagons against the outside of the curve, and gives them a tendency to run over the rail on the convex side of the curve.

Does not that tendency increase in the same proportion as the square of the speed and the smallness of the radius?—Yes.

Have you calculated the effect of this curve, and the lateral tendency to run off the rails which this speed will produce?—Yes; it is a matter of very easy calculation.

First tell us with a speed of fifty miles an hour and a load of 100 tons?—The outward tendency would amount to 93 lbs. a ton; that would be 9300 lbs. altogether; that is, with three-quarters of a mile radius.

At forty miles an hour?—57 lbs. per ton, that would be 5,700 lbs. altogether.

At thirty-five miles an hour?—47 lbs. per ton; 4,700 lbs.

At thirty miles an hour?—33 lbs. or 3,300 lbs.

These different aggregates of outward pressure would be divided equally among all parts of the train, and would not apply to any one part?—It would apply at so much per ton, according to the weight of the wagons; if the wagon was loaded with five tons, then the outward tendency would be five times 93 lbs.

Upon the wagon?—Yes.

If they were divided in a space of five feet, each one of those five feet would bear a proportion? No it is on the flange of the wheel; it would be divided between the two flanges of the two outward wheels, and the two outward wheels would be pressed outward with the force I alluded to; each would be pressed with half the weight I have stated.

If there were ten wagons, each wagon would have a tenth of the whole; and if there were four wheels to each wagon, that tenth would be divided between the four wheels of each of those wagons?—No; it is only the two outward wheels that are affected, and it is divided between them equally.

Mr. Joy.—Does not it follow from what you have stated, that a very slight addition would tend to throw the wheels off the rails?—Yes; a very slight pressure with that tendency would help them over the rails. At the junction of two rails they are very seldom flush. After they have been worked a little time one gets a little lower than the other, and the wheel coming against the corner with that pressure would give it a tendency to go over.

In your judgement, would not the danger of such a curve be extreme with respect to passenger trains from Bath to London?—Yes; I think it would be dangerous, in a train acquiring undue velocity, in descending the slope at Box Hill.

What should you consider undue velocity?—Fifty miles an hour I should consider undue velocity.

Would you consider thirty miles undue velocity?—I consider it is objectionable.

Mr. Joy.—If the Lowther Arcade has been alluded to as an illustration with reference to this tunnel, it must be considered as confined only to its similarity in point of steepness?—To its appearance; slopes upon railways have a tendency to remove the appearance of danger, and to create its reality.

What do you mean by slopes upon Railways?—I mean inclines; an incline, that has no appearance of danger when you look at it, may have a great deal of real danger in it, though that inclination is one that will not be perceived by the eye,

Do you mean to say that an inclination that does not appear to be dangerous to the eye may be so in point of fact?—Yes, there are slopes on Railways which, while they do not appear to have any danger whatever in their appearance, have a great deal in reality; it would not apply to such a slope as 1 in 1,000.

But some, which are nearly imperceptible, are very dangerous?—Yes.

(To be Continued)

Agriculture, &c.

For the New-York Farmer.

No. III.

GENERAL SKETCHES—WESTERN NEW-YORK.

BY H. C.

I could not pass Hyde Park, without paying in my own view a tribute of respect to the memory of its late public spirited proprietor, the late Dr. David Hosack, many years distinguished among the eminent citizens of the State, by his generous patronage of all public improvements. His botanical establishment near the city of New-York, was at one time a great honor to the State, which purchased it of him at less than half its cost; and which by the neglect of the State was permitted to fall into decay and ruin. He entered upon his agricultural pursuits with extraordinary zeal and liberality; determined to carry his farm to the highest degree of cultivation and improvement of which it was susceptible; and to stock it with the best animals, of the best breeds, which money could procure. His sudden death put an end to these plans fraught with great public utility; and left only the feeling of deep regret and disappointment to mingle with our respect for his private virtues, and his eminent public spirit, usefulness, and patriotism. The place has now passed into other hands, who are about availing themselves of its distinguished advantages for manufacturing purposes, and the site of a village.

The neighborhood of Albany, in an agricultural view, affords little to interest except some few eminent examples, well known to the public, of the triumph of industry and skill, over a soil by nature altogether unpropitious and forbidding. The country over which the railroad car flies, in its passage from Albany to Schenectady, is one of which we could desire nothing than a bird's-eye view; and has been well denominated by some traveller, "the abomination of desolation." The banks of the Mohawk at Schenectady, stretching out into wide and beautiful intervales, are certainly worthy of a much neater and higher cultivation than they have received, and, judging from the most transient view, must be eminently productive in good seasons in Indian corn. In the vicinity of Albany, several instances have come within my knowledge, in which large farmers, have been compelled to abandon the cultivation of wheat on account of the ravages of the grain worm; a pest which threatens most seriously the agricultural prosperity of New-York.

I was unfortunate in my passage from Schenectady to New-York, on the newly opened railroad, first on account of a severe and continued rain through the afternoon and night; and next, from some imperfection in the engine or its management, by which we were kept eighteen hours on the road, and were compelled to pass all the night in the cars. Here and there, however, we caught a glimpse of the country and some of the beautifully situated and finely cultivated farms on the Mohawk, and obtained most favorable impressions of the condition and capabilities of the soil in the fertile intervales and meadows. The road is laid almost the whole distance on the banks of the river. The German flats near Herkimer, from their celebrity scarcely need remark; and the vicinity of Utica is picturesque, luxuriant and well cultivated.

The canal on leaving Utica, passes through Whitesboro; and I have rarely seen any thing which surpasses this country in beauty and fertility. On the long level from Utica to Syracuse the country is not particularly interesting, as the canal passes through the least settled parts; and the little villages, or rather watering places, which have been planted on the borders of the canal, are any thing rather than agreeable. Of Syracuse, the great Saline of the country, I shall say nothing at present, as I design principally to confine my observations to matters connected with agriculture. The soil in the immediate vicinity of Syracuse or Salina is not fertile; but great efforts are now being made, and large expenditures incurred to bring by draining and clearing some places into cultivation, which must ultimately be highly productive. The passage to Oswego, and return to Syracuse by canal and river gave me an opportunity of seeing the land on the banks of the river Seneca; and few parts of the country, which I have ever seen, surpass this in beauty or fertility. The land at present requires no manuring; and the application of plaster which is found in abundance in this neighborhood, and ob-

tained at as low a rate as twelve and half cents per bushel., has proved signally beneficial. The hydraulic power in this vicinity is immense; and one would think almost inexhaustible. Many families however are emigrating even from this fine country to the far west; so that man never *is* but always *to be* blest.

The passage from Syracuse to Rochester, at least that part of it, which is passed by day light, presents nothing interesting. The Montazuma marshes are very extensive; and an intelligent fellow passenger suggested that they might one day be drained; but from appearances its practicability seemed questionable; and in any case, with the present amount of land of the finest description unsubdued and capable of cultivation, the prospect of such a project being undertaken seems extremely remote. The insalubrity of this place may perhaps at some future time induce this rich commonwealth to undertake it. Lyons, a pretty village at which we stopped an hour, presents several beautiful examples of ornamental and productive horticulture, in the articles of flowers, grapes, and other fruits.

At Rochester my stay was necessarily short, as my time for reaching Buffalo had been fixed by previons engagement. This town has greatly increased since my visit here in 1825. It is making large and fixed strides in business and commercial prosperity. But a small part of its mighty water power has yet been brought into use; and the fertility of the surrounding country, and the rapid increase of its population, must operate greatly to the continued prosperity of the city. I learned the great appreciation in value of farming lands in this neighborhood; and much regreted that I could not visit Wheatland and some other places in the vicinity, which were represented to me on as competent authority as there is in the State (Jesse Buel, Esq.) as among the best wheat lands in the country.

At Rochester I took the stage by the Ridge road, to Lockport. This road, well known to all travellers, is made on an extraordinary ridge of land, which appears almost to have been formed by art, rising upon an average of about fifteen feet above the level of the land on each side of it; and extending in length more than seventy miles, free from stones, and presenting for the greater part of that distance as fine a road as can be found. It is conjectured to have been formerly the shore of the Lake, which it is supposed has gradually receded; and now lies along it at an average distance of eight miles. To the west of the ridge the land is level as far as I could see; and to the east it has a slight inclination towards the lake. The growth of timber is heavy, and the soil deemed highly favorable for wheat, oats, and grass. There is no village of any importance on the whole route; but the country is generally settled; and the farm houses have an aspect of unusual thrift and comfort. The proximity to the canal on the one side, and lake Ontario on the other gives to this country peculiar facilities of intercourse with the great markets; and this added to the excellence of the soil must presently create here a dense and busy population; at present however, with this as with many other parts of the country the cheapness of the rich soil in the west, the increasing facilities of emigration, the rapid advance of property in these western settlements, and added to all the electrical charms of emigration, which make obstacles and difficulties fade away, will operate against an immediate increase. Remarkable indeed as the fact may seem, my own observation shows that no section of the country has within the last two or three years sent out a larger proportion of emigrants to the west than Western New-York. Now what is the reason of this; certainly not that the agricultural advantages of Western New-York are not equal to any part of the world. But several other reasons may be assigned. One is that the scene of speculation in the West, especially in Michigan, is nearer to New-York than to many other parts of the country; and the facilities of emigration by canal and steamboat, are as great as could be desired. They are therefore more within the moving and attracting waters of the vortex of excitement. In the next place many of the settlers in Western New-York, either took their land in its original state, or bought in at a low rate from the first settlers, and being, by the improved condition of their estates, as the general advance of the price of landed property, considerably enriched, they sell and immediately proceed to invest their increased means in the cheap and rich lands of the west; and go out with large and vigorous families, 'to cause the wilderness to blossom like the rose.' Of the many hundred of settlers whom I met in Michigan, a large proportion of them, there was no difficulty in ascertaining, were from Western New-York; and from their manners, clothing and equipments, they showed themselves to be among the most substantial and independent yeomanry of the country.

From Rochester my passage was made in the night to Niagara River. I lost at that time sight of the beautiful lands on the Tonawanda Creek. A prejudice has existed against these lands from their reported unhealthiness, on account of the back-water, occasioned by the dam at the village. But there is good reason to believe that this prejudice is unwarrantably strong; and that the clearing of the country, which is rapidly going on, will, as in other cases, obviate these objections, which have, no doubt, operated against its settlements; and when the present violent tide of emigration has in some measure slackened, show the extraordinary advantages and desirableness of their lands.

Feb. 1837. H. C.

NEW FURNITURE.—A New-York Yankee has invented an improved bee hive, which is said to have the appearance of, and to be, in fact, a mahogany side board, with drawers above, and a closet below; with glass doors, to be placed in the chamber of a house, and to be connected with the open air by a tube passing through the wall. The operations of the bees are clearly seen through the glass doors, and the honey is deposited in the drawers.

☞ We have received a highly valued favor from the Hon. Abbott Lawrence, dated 15th inst, House of Representatives, Washington, relating to a parcel of *Seed Corn*, which has four or five ears on a stalk, &c. The package has not yet arrived, and we received the notices of the donation and the statements with which it was accompanied, too late for this paper. We have now only room to express our thanks to Mr. Lawrence for this repetition of his kindness and attention to the Agricultural interests of New-England. His letter and the documents with which it was accompanied, shall be published in our next.

[New-England Farmer.]

☞ A Premium of One Hundred Dollars, is offered for the best experiment made in the year 1837, in fattening various animals on apples—the premium to be awarded by a Committee of three Farmers, to be named hereafter in this Journal.

[Amer. Temp. Union.]

From the Vermont Chronicle.

BEES AND HONEY.

Honey raised in a cold climate and mountainous country, is the purest and best. As a source of profit, very few persons in Vermont keep bees, and yet we are convinced that the Green Mountains might become as distinguished for excellent honey, as they are for first rate Beef, Pork, Butter and Cheese.

We lately cut the following from a New-York paper:—

HONEY.—In passing through the garden emplyed by the American Institute, our attention was directed to some boxes of Honey, of a clear, white and beautiful transparent appearance, such as has seldom been seen in the New-York Market. It is presented by Messrs. Wilcox & Cone, of West Broomfield, Ontario County, Ohio. One of the firm has furnished us with the following statement:—

"Last spring we had not more than 220 swarms, this fall we had over 420; nearly

all of the young swarms are good to winter over. We have taken from our bees 3,700 lbs. of box or cap honey; in addition to this, we furnish all the vicinity where we live with boxes, showing them how to manage, promising to buy all the honey that was built in them. This added to our own, made 5,641 lbs. All of this was taken away without destroying a single swarm of bees. Near seven-eighths of this honey was of the white, such as was exhibited to-day; it arrived in New-York market on the 9th of September; nearly two-thirds of it is already sold. We have adopted this plan to make our bees profitable, and not destroy an insect that is such an example of industry."

Wishing to give our readers more information respecting such an instance of successful business in the hive, we wrote to Messrs. Wilcox & Cone. From their very obliging answer to our inquiries, we copy the following:

Our hives are of almost all descriptions commonly used, having bought many of them. We prefer the smaller size, such as will hold about thirty pounds of honey when well filled, as that will be sufficient to winter a common swarm, and such hives swarm the most. We procure our honey from a box of about seven inches square, placed on the top of the hive. The box should be made to fit very close to the hive, and no communication out of it only through the hive. The hole should not be less than three inches square. These should be put on the old hives, before the Bees begin to gather from the white clover, and on the young swarms when they are first put into the hives. In this way, instead of the bees lying on the outside of the hive, idle, as they commonly do, they have room within the box, where they continue to build, and gather, till they are ready to swarm.—Many of our swarms do not work on the boxes at all; but by boxing them all, we average from 7 to 16 lbs., from every old swarm. Last year we got over 16, it being more than a common season for honey.

We have not been troubled much with the moth; having so many hives together the birds keep them mostly subdued. We think it the best plan to raise the hive so that the bees can just pass out all round the hive: they keep the bottom board clean of comb dust, so there is less chance for the millers to deposite their eggs, where they will not be destroyed. Care should be taken to kill all that can be found on and around the hives every day or two.

We use no means to furnish our bees with food, excepting to feed some light swarms towards spring; which we do, by putting comb filled with honey, in the box on the top of the hive. Bees flourish the best where there is plenty of Elm, Sugar Maple, and Basswood, and where the soil is natural for white clover. Elm and Maple blossom early in the spring; after the spring flowers are gone, bees stir but little, until white clover begins to blossom; if it fills well with honey, bees soon fill their hives and begin to swarm; if not, they swarm late, and the swarms stand a poor chance; the Basswood and Buckwheat are the principal flowers they have to gather from. Sometimes there are honey dews which help them much.

Our box honey, which is pure and free from bread, is gathered principally from Clover and Basswood blossoms.

Our hives stand in the same situations winter and summer. We are careful to have the tops secured so as to keep the snow and water out, and not admit a draught of air through the hive. Every hive should have a three quarter or half inch hole from four to six inches from the bottom, in front, to afford air in winter. In very cold weather, frost accumulates in the hive, from the breath of the bees, and in mild weather it melts and runs down to the hole at the bottom and freezes to ice and shuts out the air, if there is no other air hole. Many bees are smothered greatly for want of this knowledge. Bees winter the best in straw hives, but do as well in summer in board or tub hives.

There is a variety of opinions on the subject of bees, owing we think, to their being liable to change. Two swarms in the spring may stand side by side, and to appearance, be equally good; one may prosper well, the other dwindle away and die; or they may both swarm equally well, and one a few weeks after swarming be robbed; the other winter well.

Our reason for this is, that in swarming time, the Queen or Queens, if there be more than one, (as there frequently is at this season of the year, but at none other,) all leave the hive with the swarms, and leave but few working Bees and Drones in the old hives; which, of course, without a Queen die. Sometimes they will guard their treasures till winter, and then die, and leave the hive well filled with honey.

After swarming is over, such hives as have swarmed out, we take up as soon as they are likely to be robbed, and save the honey. In October we examine our young swarms, and take up all that have not nearly enough to winter on. In this way be obtain much honey, and destroy none of our good swarms for increase.

P. S. In a statement of ours that was published in some of the New-York papers, showing the amount of honey that we raised the past season, there was a mistake made by the Editors. It was printed 700 pounds, but it should have been 3700.

French Blues, is the name of a Potato, a specimen of which has been left at our office, by Mr. Moses Winslow, of Westbrook; it is said that they were imported a few years since. The appearance of these potatoes recommend them as to productiveness; they are so large that a man could hardly walk straight with one in a side pocket. They are of a good quality when raised on a dry soil; are very solid and heavy, of a roundish form; the inside is of a beautiful yellow color. Mr. W. informs us that he has raised a peck in a hill after separating the small ones; and that they produce far more than any other potatoes that he has cultivated. We have these potatoes for sale by the bushel, peck, half peck, or single. Those who try them should put them on rich ground, as they may as well think of making a large hog on a stinted substance, as to raise such potatoes as these on a lean soil.

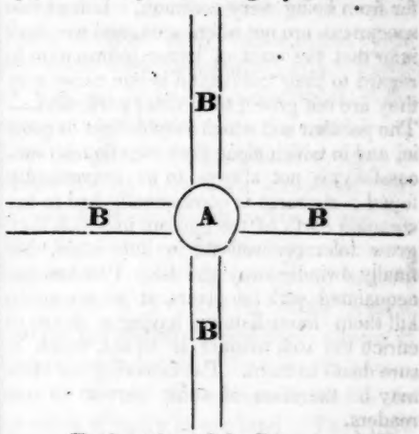
[Yankee Farmer.]

From the Baltimore Farmer and Gardener.

A CHEAP PLAN FOR BURNING SHELL LIME.

Having had several applications from our subscribers for a plan for burning shell lime, we have procured the subjoined *sketch* of a *lime kiln* from a gentleman whose experience and success qualify him for the task. We are the more pleased with these frequent calls for information upon this head, because it affords to our mind the best possible evidence, that the spirit of improvement is abroad. The *Diagram* given below, is for 3,000 bushels of sheels; its dimensions can be either increased, or decreased, to suit the quantity intended to be burnt.

The kiln should be preserved in its square form, hence the necessity of bringing out the wood to the extreme points of the square in every succeeding layer of wood.



Explanation of the Diagram.

To burn a kiln of 3,000 bushels of oyster shells the kiln must be 33 feet square, and be constructed as follows:

A. A circular excavation, or pit, 3 feet wide, and 1 foot deep. In this centre, wood 4 or 5 feet long is placed endwise, forming an arch or partial funnel, beneath which place straw, brush or other small dry wood that will ignite rapidly, so that fire can be communicated through the flues by means of a rod or pole attached to it.

B.B.B.B. Trenches, 1 foot wide and 1 deep, extending the whole length of the kiln and communicating with the centre A. These trenches or flues must be kept open during the whole operation of burning, as the perfect burning of the shells depends upon it. In order to keep them open, large green logs of wood that will not burn out speedily must be placed cross-wise, close to each other, and if entire logs extending the whole length of the kiln so much the better. Wood must now be put over this entire surface, say 2 *feet* thick, then throw on oyster-shells, say 1 foot deep, levelling them so as to present an even surface; then wood 2 feet deep, next oyster sheels 3 feet deep, and so on alternately, increasing the quantity of shells and decreasing the quan-

tity of wood as you progress up to your terminating point. It is important to preserve the kiln *square*.

In order to secure a good fire at the onset, brush-wood, old dry stumps, or d y lap-wood of any kind should be liberally intermixed with your other wood, and after the kiln becomes once thoroughly ignited, there will be no other difficulty than that of preserving an equality of heat; this with very little attention may be effected.—Whenever the burning is greater at one point than another, the flue, or trench, in that direction should be stopped up with mud or earth, which must be removed, as necessity may indicate. After the kiln is fairly fired, one or two men at farthest will be sufficient to watch it, as the only care necessary is, to check any irregularity of the burning by throwing mud on the part.

The shells will effectually be burnt in about three days.

From the Horticultural Magazine.

ON THE CULTIVATION OF THE HYDRANGEA, (H. HORTENSIS.) BY THE CONDUCTOR.

This very showy and highly ornamental plant, though it has long been cultivated, is far from being very common. Indeed fine specimens are not often seen, and we may infer that the want of better information in regard to their cultivation is one cause why they are not grown to greater perfection.—The peculiar soil which they delight to grow in, and in which alone they ever flourish successfully, is not always to be conveniently found; recourse is consequently had to the common earth of the garden, in which they grow tolerably well for a little while, but finally dwindle away and die. Persons unacquainted with the plants, at all, are apt to kill them immediately; having a desire to enrich the soil, manure is added, which is sure death to them. The following few hints may be therefore of some service to our readers.

Hydrangeas are cultivated by layers and by cuttings; the former make the largest plants in the shortest period of time, but the latter method is the most convenient, and the plants are handsomer shaped. To propagate by layers, all that is necessary is to plunge the plant in the garden, or turn it out into the soil, and place round it some suitable earth; then make a slit in the shoots, longitudinally through a bud, and peg them into the soil, covering them over an inch or two in depth. The operation may be done either before or after the plants expand their blossoms; in either case they will generally root very easily. To propagate the plants by cutting, the shoots should be taken off in the spring, about a fortnight previous to the breaking of the buds, just as they begin to swell, or in the fall, two or three weeks after they have finished their summer's growth, and the wood begins to harden. The former season may be chosen to procure flowering plants of a small size, but the latter should be preferred where the object is only to get plants, without any regard to their early blooming. Cultivators who put in cuttings in the spriug go over the old plants and select such shoots, as, from their swelled appearance and firm feeling, they judge will throw out flower-buds; these are cut off below a bud, with from one or three inches of the wood, and are inserted singly in small pots, and plunged in a gentle bottom heat, and shaded from the rays of the hot sun; they soon emit roots, and they are then shifted into the next size pots, (No. 2) in which they generally produce a fine large umbel of flowers. Plants thus treated have a very pretty appearance, the flowers sometimes being three times the size of the pots they are growing in. This mode may be adopted with amateurs, but is attended with more care than that of taking off the cuttings in the autumn.

After the summer shoots have acquired some solidity, and begin to assume a slightly brownish tinge, cut off the ends of as many as there are plants wanted; let them be about four inches long, and contain six leaves; be careful that they are cut across, directly under a bud; trim off the two lower leaves, and insert each cutting in a No. 1 pot. Place them in a frame or against a north wall, where they will be shaded from the sun for a month; by the end of this period they will have made sufficient roots to be removed to a warmer situation, where they may remain until severe frosty weather, when they must be taken into the greenhouse frame, or, in want of either of these, the celler. The soil in either of these modes should be composed of peat or leaf mould, with the addition of about one-third sand.—Out of twenty-five cuttings, the most we ever put in at any one time, not one failed to grow treated in this manner.

The after management of the plants is very simple; the following season they should be shifted into No. 2 pots; and, as they continue to grow, they will require larger ones, until they reach such a size as to need large tubs. The soil should be peat, from low situations, or bog earth, or, if these cannot be procured, leaf mould. Give a good drainage to the pots, as stagnant water is injurious to the roots. When the plants come into bloom, keep them well saturated with water, and let them stand in situations where the sun shines only a few hours in the morning. The proper season for potting is early in March, just before the plants begin to grow.

Much has been written respecting the cause of the flowers sometimes opening blue and at others red, various modes have been recommended to make the plants produce those of the latter color. Bog earth, loam, and saturating the plants with water, in which iron filings have been steeped, have each been tried, to produce the effect, and each have answered as well as failed to do so.—That it is owing to the presence of oxide of iron in the soil we have no doubt; and when bog earth or loam can be procured of the right kind, the color will be changed. This we know to be the fact. A few years since we tried the experiment upon a plant; it was an old one, and was separated so as to make two; one was planted in bog earth, and the other in a hazel colored loam: the flowers of the one in the bog earth were red, and on the other, in loam, were of a more intense blue than any we have over seen since.—Cuttings that we have raised and planted in the same loam have flowered blue. There are, perhaps, few soils that possess this property, but when one is found a stock of it should be secured, if blue flowers are desired; the plants do not, however, grow so vigorously as in bog earth. It is a good plan to grow the plants a year or two in loam, and then shift them into the bog earth; but it must be remembered that the latter soil will sometimes produce blue flowers.

Hydrangeas should then be in every garden: the long period which their flowers remain in perfection, and the care with which they are grown, should entitle them to the notice of every lover of flowers.

[This article was written to appear last autumn, but was laid aside to accommodate our correspondents.]

SHEEP HUSBANDRY.

Extract of a letter from a subscriber in Maryland to the Editor of the Genesee Farmer:

"While I have my pen in hand, it may not be amiss to give you a brief account of the very handsome profits which I have realized from a small flock of sheep during the past year. When I came into possession of my farm a short time since, I found on it twenty ewes of a very indifferent breed, and of that breed not the best in age, size, or in any other respect. They were fed during the last winter on corn fodder, with the addition of turnips for a few days about the time of yeaning. After this, (the early part of March) they received no food except what they could find for themselves in the fileds. These sheep, thus treated, yielded an interest during the following summer, of 87 per cent., on the sum for which they could have been readily purchased the preceding fall, as follows:

20 Ewes at $5	$100 00
22 Lambs at $3	66 00
50lbs. of wool at 42 cts.	21 00
	$187 00

It is maintained by some writers in Agricultural papers that the manure of this animal is a full equivalent for all the food which it consumes; but supposing this to be an exaggerated estimate, and that the manure of this number of sheep during a year would be less in value than their food by $50, still there is a nett interest of 37 per cent.

Is it not surprising, and much to our discredit too, that when such are the profits of sheep husbandry, we should import such large quantities of wool? and also that persons should leave their pleasant homes in the Northern and Middle States, for the wilderness of the "West?"

GOOD ADVICE TO A FARMER.

"Many years ago," said a quaker friend who told us the following anecdote, "many years ago, a brother of the celebrated Benjamin West, who had been a cooper in this city, a man of sterling sense and integrity, purchased a farm some miles out of the city which had been suffered to be overrun with briars and bushes. He was for a short time considered by his neighbor farmers as very far from being as wise as Solomon or even themselves, but in a few years his was the best and most productive farm within fifty miles around him and his fame as a farmer spread far and wide. One day a man came to him who was desirous of improving his farm, and asked him how he should do it. Go home, said Mr. West, and mske five or ten acres as rich as thee wants, and come to me and I will tell the what to do next. But,

said the farmer, I have not manure enough to do that. Very well then, go and prepare three acres, two acres, or one acre in the same way, but what thee undertakes, do well. The farmer, said our friend, perfectly comprehended the advice, and what is unusual, practised upon and benefitted by it. leaving at his death, one of the best farms in the country." Go and do thou likewise. —[Phil. Herald.]

ADDRESS BEFORE THE ESSEX AGRICULTURAL SOCIETY, SEPT. 28, 1836. BY NATHAN W. HAZEN.

We have received an address delivered in September last by N. W. Hazen at the Annual Cattle Show of the Essex Agricultural Society in Massachusetts, which we shall with pleasure lay before our readers. The Essex Society of whose reports we have often availed ourselves, stands in the front rank of the Agricultural Societies of the Country for its useful publications and improvements. No Society in the country has done more; few have done so much; and it is only to be lamented that their useful example should not be followed by a more spirited emulation. The address has anticipated the appearance of their Annual Reports, of which it usually forms a part. The reports, as soon as received, we shall have much gratification in laying before the agricultural public.

Mr. Hazen's address is sensible and useful; and is entitled to great credit for the neatness and perspecuity of its style. It contains many excellent suggestions; we may dissent from some of the opinions expressed; but we shall not dissent without a perfect accordance of the right of private judgment even to those, from whom on any subject we most differ. If there were no difference of opinion there would be no discussion; and without discussion, the entrenchment of error would remain impregnable, and the progress of truth be essentially, if not utterly, impeded.

Mr. Hazen details some striking facts in respects to the importations of bread stuffs into New-England from various other States, when she ought to be able in this matter from her own resources to supply her own wants. We believe that New-England, if not capable of doing this completely, may yet nearly approach a perfect supply of her necessities. Her cultivation compared with the increase of her population, is unquestionably on the decline. It would be of the highest importance to her as a community, if her resources and capacities in this matter could be ascertained and made known. It would be of much greater importance to her in respect to morals than any extraordinary increase of wealth from other sources can be in other respects, that this subject should engage the serious attention of her young men; and that sufficient inducements could be found for them to remain at home: and engage in the honorable, useful, and independent pursuits of agriculture. But how this is to be done while the fever of sudden acquisition is so universal and epidemic; and the pecuniary returns of all mechanical and manufacturing employments and of commercial pursuits likewise so much exceed those derived from agriculture, it is difficult to say. It is however, particularly desirable to show that agriculture in New-England is by no means a losing concern; but that, well conducted, it is sure to afford all reasonable and a certain reward for labor: that under an improved agriculture its gains might be expected to be more than double; and above all, that its gains are always honest gains; and that its labors pursued with due diligence, discretion and frugality, are almost secure of a competence, and an honorable independence.

In speaking of the improved Argiculture of Great Britain, Mr. Hazen remarks; "How wonderful is the spectacle, when having provided for her own consumption, we see that narrow island, loaded and crowded with its millions, excelling the world in arts and commerce, importing from the stores of its abundant fertility, grain for the food of the people scattered over this broad continent." And in another place he remarks, "We are told that arrangements have already been made for importing in the present year fifty thousand bushels of wheat from the single port of Liverpool, &c." We apprehend it will be found a mistake to suppose that the wheat imported into this country from England is grown in that country. The wheat referred to, (and the importations into this country from the European Continent will fully realize the expectations that have been formed,) was no doubt German or Polish wheat; or it may be wheat from ports in the Mediterranean, first imported into England and there remaining in the public warehouses under bond. The cultivation in England is indeed carried to an extraordinary perfection; but England has no bread stuff to export. She has an immense population, withdrawn from the labors of agriculture, who are to be supported; and it seldom happens that she has not many more mouths to be filled than bread to fill them with. England protects her agricultural interests by severe corn laws, imposing very heavy duties on foreign wheat and flour, which amount indeed to an absolute prohibition, until the price of wheat in the home market reaches a certain point; and then the ports are thrown open to the admission of foreign wheat and flour; and vast amounts, which remain under bond in their public warehouses, are then brought into market. Large amounts of wheat of the finest description from the Black Sea have been brought into Boston this very season by importation from London, where it was laying in bond. It is a melancholy anomaly in the political condition of this great and prosperous country, that in the midst of her extraordinary wealth and prosperity so large a portion of her population should be famished for bread. There were imported into England the last year from Ireland alone, of wheat 3,697,832 bushels, and of meal and flour 1,100,463 quarters; and into the Isle of Man, of wheat 151.968 bushels; certainly an immense amount to be drained from a country, where those, who raise the wheat, are compelled to subsist mainly on potatoes.

In comparing English Agriculture with our own, many things are to be taken into consideration; and a system of cultivation which might be highly eligible in that country, would work very badly in this. Labor in England is usually not a third of the price of labor in this country; and heretofore the prices of Agricultural produce in Great Britain have been enormous. At present they are much reduced, and the landed interest are complaining of ruinous depression. The labor bestowed in their cultivation in England is vastly greater than in this country; and their returns in general are greater. We have the advantage of them in the cheapness and in the newness of much of our land. They have greatly the advantage of us in their exactness and system, which pervade all their operations. They lose nothing; they waste nothing,—our farming in general is extremely hurried, slovenly, and wasteful.—They have a great advantage over us in the power of procuring any amount of labor at any time when needed; and in availing themselves of the services of women and children, who in many cases perform the work of men, at much less wages, and less expense of board. No such service is known among us. Indeed the exempts from all labor in our community is a very numerous class, and constantly increasing, to the great injury of the community.—Labor with us is daily becoming more difficult to be procured, and few farmers in the country are so situated, that they can obtain any amount needed at pleasure, on any sudden emergency. With them labor is furnished at pleasure as matter of necessity; and as a favor to the poor to be employed. We have in truth no such class of poor in this country; and with us labor is bestow-

ed on the employer as matter of condescension and favor. In that country no man undertakes to carry on a farm without a fixed capital; and of such an amount as will enable him to apply whatever amount of manure or labor he may deem necessary, and pay all the current demands of the farm for the year; and to hold his crop until they can be sold to advantage. I fear the reverse of all this is in general the case in this country. Without capital a farm can no more be managed to advantage than a manufactory or a voyage.

The remarks of Mr. Hazen on the proper size of farms need much qualification. We agree with him that a farm is too large for the owner, which he has not either the capacity, or capital, or disposition, to manage and husband as it should be done; that a small amount of land highly cultivated, is better than a large amount poorly cultivated; though where land is as cheap and labor as dear, as it is in this country, it is by no means always the most profitable mode, though far the most satisfactory mode of cultivation; but the proper size of a farm can be determined only by considering it relatively to its situation, the character and condition of its soil, the kind of husbandry for which it is designed, the labor attainable, and the capital to be employed in its cultivation. Farming in general in New-England seems to be pursued only as subsidiary to something else; or some trade or profession is deemed necessary to eke out its products. We do not refer to these cases, which must be regulated by peculiar circumstances; but where farming is an endusive pursuit, and pursued with a view to profit, the farm ought to be large enough to occupy all the superintendence, labor, and capital which the proprietor can apply to it; and the character of the cultivation suited to the kind of crops raised; always deeming those the best crops, which best compensate the labor of cultivation; and that the best cultivation, which causes the greatest product.

H. C.

From the New-England Farmer.

FARMERS' WORK.

EWES AND LAMBS.—It is incumbent on every good husbandman and faithful shepherd, to feed his Ewes plentifully for a few weeks before, and for a considerable time after they produce their lambs. Good farmers have told us that they have found it very beneficial to give to each of their ewes about one half a gill of Indian corn a day, for 5 or 6 weeks before they have yeaned, and while suckling, to give them good roots, or some other juicy food. The want of milk in the ewes, is the most general cause of death in the lambs. Keep the mothers well, and their offspring will thrive and be strong.

The *Farmer's Manual* says, "If you have stored more turnips than are sufficient for the use of the table, give them to any stock that will eat them, except your sheep: give to them potatoes, but not turnips at this season, for turnips will injure the lambs."

Weak lambs should be treated in all respects as if they had been drowned, and you was endeavoring to restore them to life. Apply gentle and regular warmth; give them warm milk, frequently, in small quantities, (the milk of the sheep is best,) and if the ewe has milk sufficient for the support of the lamb, you may generally raise it, otherwise the lamb usually dies. It requires more care and labor to nurse one feeble lamb, when its dam yields too little milk for its support than it would for an hundred, if they were healthy and well kept.

If your sheep, whether store sheep or ewes with lamb, have good hay, about a quart of potatoes a day, to each, will it is said be very beneficial, and an ample allowance. But when the object is to fatten them, (says a writer in Rees' Cyclopedia,) about a gallon of potatoes a day, with a little hay will be the proper quantity; but this is dependent in part on the size of the animals, and in part on the quality and quantity of the hay, which is allowed them. Potatoes, besides their use as food for sheep, are said to be very serviceable to those animals as an article of diet, which usually supersedes the necessity of *medicine*. They have, when given raw, an opening or purgative quality, which is thought to be of use, and to answer a similar purpose with sheep which is effected with swine by brimstone and antimony.

Care should be taken to place in the stable, small tubs or troughs of water for the sheep to drink in. They will do very well in summer without water, as they feed when the dew is on, but they need water in winter, especially if fed mostly on dry food. Deane's N. E. Farmer states that "when sheep have colds and discharge mucus from the nose, good feeding, together with pine boughs given occasionally, will cure them; or tar spread on a board over which a little fine salt is strewed, will induce the sheep to lick up tar, and this will cure a cold."

The *Yankee Farmer*, in giving directions for raising lambs, observes that "great care should be taken when lambs are born, for it is frequently the case that their fore teeth are not cut, which makes it very difficult for them to hold the teat, so as to suck when young and weak, and it is common for lambs to get discouraged, though ever so rugged at first. To remedy this evil rub the thumb nail, or any hard substance, over the gums, sufficiently hard to cause the teeth to cut through, and the lambs will then be able to suck without any difficulty."

Clay has been recommended as useful for restoring and preserving health to sheep. A writer in the New-York Farmer gives the following remarks on this subject:—"I am told on creditable authority, that a gentleman, who was losing his sheep without apparent cause, had occasion to use some clay about his house in the winter, and observed that his sickly flock ate it with avidity; he caused a load to be placed in their yard, much of which was devoured, and his sheep speedily recovered.

"As a cure, therefore, I would recommend clay to be placed in the sheep yard, which can, at worst do no harm, as the animals will not eat it, unless prompted by instinct."

From the New-England Farmer.

CALVES.—The following mode of rearing Calves, adopted by the Society, denominated Shakers, in Canterbury, N. H., was communicated in a letter from Francis Winkley, to Levi Bartlett, of Warren, N. H., and was published in the N. E. Farmer, in 1824; but such have been the changes since that period, in our subscription list that it would probably be new to many of our readers.

"We let calves that come in the fore part of March, suck a week or ten days, then take them from the cow, giving them a moderate allowance of new milk to drink till they have learned to drink it freely; then put in some skimmed milk; and we feed them wholly with skimmed milk, taking care to give it at about the temperature of milk taken directly from the cow, by heating a part of it and mixing it with the rest. Care should be taken not to scald the milk, when heated; also, not to give them any sour milk, for this will make them scour. The trough or vessel in which they drink their milk, should likewise be kept clean, and not suffered to become sour. We let the milk stand about twelve hours before it is skimmed; giving a calf at first about four quarts, night and morning; increasing the mess as need requires, till he is six weeks old, from which time till ten weeks old, he will require, perhaps about 12 quarts per day.

"When about ten weeks old, we begin to diminish the quantity of milk for about the space of two or three weeks, at which time we wean them. During the whole process, from two to fourteen weeks of age, calves should be well supplied with good hay, salt and provender, such as oats, wheat, bran and oil cake, ground fine.

"The particular advantages to be derived from the above method of treatment, are the following:

"1. It is much cheaper than to let them suck in the ordinary way; whereas it makes a great saving of cream for butter, and that without injuring the calves, if they are properly attended to.

"2. It prevents calves from moaning or pining, so much while weaning as they would otherwise do, when taken from the cows.

"3. It not only prevents the cows being injured in consequence of the calves biting the teats, but also prevents their holding back the milk from the milker, which often serves to diminish the quantity of milk afterwards.

"The only disadvantage to be found in the above method of treatment is, that it requires some more labor to feed them, where they thrive equally well in every respect as those do which are permitted to suck in the ordinary way.